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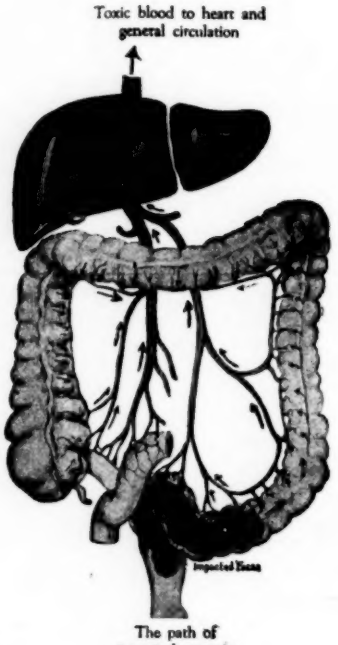

The path of intestinal toxemia

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Medical Times

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The Glands of Internal Secretion*

Physiology of the Gonads.

H. LYONS HUNT, M.D., L.R.C.S., L.R.C.P., Edin. L.F.P.&S. Glasgow

CONSULTING PLASTIC SURGEON, MIDTOWN HOSPITAL;
CONSULTING SURGEON ON PLASTIC SURGERY, LEXINGTON HOSPITAL,

New York

Physiology of the Glands

Janeway recalls the fact that every cell in the body comes into a more or less close relation with the blood stream. Such a relation is necessary in order that the cell may obtain from the blood those substances which are necessary for its metabolism, and be freed from those substances which result from its metabolism, but which are no longer of use to the cell. Many of these latter substances serve a useful purpose in the body. For instance, carbon dioxide and lactic acid, the final oxidation products of muscular tissue, possess important actions on the medullary centers. These substances regulate entirely the amount of oxygen which is taken into the body, and to some degree the blood pressure and activity of the heart. They may be classed as hormones, that is, substances formed as the result of the activity of one set of body cells, which produce an important influence upon the activity of another set of cells. Other illustrations of substances, even more strictly hormonic in their action, are the gastric, pancreatic and intestinal secretions.

Thus far, the production of all the hormones which have been studied have not appeared to represent the main function of the cell which produces them, and which is certainly not its sole function. They do, however, illustrate the important fact that the useful products of cell activity, in other words, its secretion may be discharged not only on its free surface communicating with the exterior of the body, but into the blood stream as well.

Almost the entire secretion of the glands, formerly studied, is discharged into ducts opening upon the free surface of the body. There are other glands, however, that have no ducts. Their entire secretion is discharged into the blood stream. The glands may therefore be classified into glands of external secretion and glands of internal secretion. Actually there is no sharp line of demarcation between these two kinds of glands, for almost every transition exists between them.

Some glands possess both an important internal and external secretion. It is proper, however, to consider separately all glands which produce an internal secretion as one of their salient functions. The glands belonging to this group are the thyroid, the parathyroids, the thymus, the suprarenals, the hypophysis, the pineal gland, the ovaries and testicles, and the pancreas. Of these, the thyroid, the parathyroids, the thymus, the suprarenals, the hypophysis and pineal glands are pure glands of internal secretion. The production of an internal secretion by the ovaries, the testicles and the pancreas forms a function of these organs equal in its importance to the body to that of their external secretion.

With Dercum we want now to turn our attention to the sex glands, the testicle and the ovary, or, to use the term applicable to both, "the gonads."

Beginning with the testicle, Dercum points out that the first fact to recognize is that the testicle is made up of two portions, one of which produces the germ cells, while the other produces an internal secretion. The former is an epithelial tissue, and the latter an interstitial tissue. The latter made up of cells called "the cells of Leydig" is of mesodermal origin and not unlike the adrenal cortical tissue. It is intimately related to and concerned in the development of the secondary sexual characteristics. Diseases which destroy the germ-producing portion may leave the interstitial portion intact, in which case the secondary characters remain un-

*This is the first of a series of articles on this important subject which will appear monthly in the MEDICAL TIMES.

changed; such facts are observed now and then in cancer and tuberculosis of the testicle. Again, when the vas deferens is obstructed or resected, the germ-producing portion atrophies but the interstitial portion persists, and with it the secondary characters; similar results are said to follow sterilization by the *x*-ray.

The effects of the entire absence of the glands, i. e., of castration, are most instructive and significant.

Lipschütz thinks it is probable that the castration of bulls was universally practised wherever agriculture was sufficiently developed as to be based on the employment of animal labor. It is at the same time very probable that the castration of man was performed in very ancient times. But what we know about the results of castration in man comes almost exclusively from observations collected in the last few decades. Castration has been performed frequently in recent times for therapeutic reasons; e. g., in cases of tuberculosis of the testes, osteomalacia and different affections of the abdominal organs in women. Cases have been observed where the testes had been lost through accident, or owing to criminal injury. Finally, the senile atrophy of the sexual gland in both sexes may be considered as a sort of physiological castration.

Cases in which the testicles or ovaries are described as being congenitally absent are very problematic, as Tandler and Gross have shown. But a deficient development of the testicles and ovaries has often been observed (Hypogonadism).

The morphological and physiological changes which follow castration vary according to the age at which the organism is castrated.

After pre-puberal castration in man, i. e., after castration in the first decade of life, the genital organs do not develop in a normal manner. The penis, the vesiculae seminales, and the prostate are under-developed. They are abnormally small. The beard does not develop. Only lanugo is present on the face. But in old age there may be a development of the beard like that present in old women. In the pre-puberally castrated man we find, as in the normal woman, an horizontal or even concave limit of the hair in the regio pubis. The rest of the body, the axillae, and the extremities are deprived of the hair normally present in the male. The skin is pale and often swollen and creased. The subcutaneous fat is more developed than normally. One finds much fat in the gluteal region, under the breasts, over the trochantres, in the abdominal wall, especially on the mons veneris and on the lateral sides of the upper eyelid. It seems there are two different types of castrates, the fatty and the thin one.

The skeleton of the castrated individual shows also some characteristic changes. The zone of proliferation of the epiphyses in the extremities remains longer than usual. As the growth of the long bones is continued beyond the normal time, the castrated individual attains a greater height, caused by the longer growth of the lower extremities. Consequently, there is a disproportion, the under part of the body being too long as compared to the upper part. The pelvis has a juvenile form. The larynx is in its shape like a slightly enlarged infantile type. The voice remains for the whole of life the same as in the normal boy before puberty.

All the Skopeks, the adherents of a Russian sect, thus far examined, were found to have an extremely small thyroid gland. We have no exact knowledge on this point.

Case No. 1

In two cases which came to the attention of the writer, one a castrate and the other a eunuchoid, he found a subjective symptom common to both. Each complained of coldness from the waist down. Each also complained of the sensation of bands circling the body. The eunuchoid so developed following an injury to his spine at the age of 12 years. This was followed by complete impotence, complete atrophy of the left testicle and a fibrosis of the right. The face was hairless, the axillae and pubis were sparcely covered, the voice was falsetto (gland transplantation was performed in this case, which was followed by normal erections, beginning three weeks following operation, but lasting but a few months).

Case No. 2

In case No. 2 a young man of 34 was castrated at the age of 16; face and body hairless; voice culture overcame a falsetto voice, which developed several years after castration. This case had normal erections, normal desires for the opposite sex, and quite capable of normal sexual intercourse. (Transplantation in this case removed the thermic sensations complained of.)

As to the early castration in women, Dercum states that they are taller, while the secondary sexual characteristics are wanting, as in the male. Castration after maturity leads to the atrophy of the uterus and breasts and to an increase in fat and body weight.

It is often said that an hypertrophy of the mammae takes place after castration in man; according to Lipschütz probably only an accumulation of fat occurs without any hypertrophy of glandular tissue.

With reference to the psycho-sexual behavior of the prepuberally castrated man one often reads that erection and cohabitation are still often possible. Lipschütz thinks that we cannot take all statements on the potentia coeundi after prepuberal castration seriously.

The general intelligence does not seem to be influenced by prepuberal castration, but a certain apathy is a characteristic feature, and sometimes psychical disturbances of a not very serious character occur.

It seems that in regard to libido and sexual activity after post puberal castration, great individual variations may occur.

After considering the effects of the entire absence of the glands, i. e., castration, Dercum directs our attention to the subject of eunuchoidism, represented by individuals more or less resembling castrates, namely, "the eunuchoids." Here we again distinguish two forms, the tall and the fat form. The first represent the early cases. There is, again, besides the increase in stature, the same disproportionate length of the extremities, and the same persistent epitheseal separations. The sella is not increased in size, which, of course, does not exclude pituitary involvement. In the second group we find similar excessive deposits of fat, as in the corresponding group of the eunuchs, and the same absence of secondary sexual characters is revealed, especially in the early cases. In later cases, hair upon the face, in the axillae and on the pubis is thin or falls out; the hair of the scalp may be well preserved, but it becomes dull and brittle, and early turns gray. The penis and testicles are small; in women the uterus and ovaries are small. The thyroid is small; the thymus, on the other hand, shows an increase in its parenchymatous—its epithelial elements.

When we compare the findings in the eunuchs and the eunuchoids, we learn that these findings are entirely due to the loss of the internal secretion of the testicle; the loss of the germinal portion of the gland seems to be without any effect on the organism. The excessive adiposity suggests the findings in dystrophia adiposogenitalis, and this, together with the small thyroid and enlarged thymus, points to a multi-glandular involvement featured by the special factor of failure of sex development. Many of the symptoms suggest the findings in the status thymicolymphaticus. Little by little the fact of the glandular inter-relations is impressed more strongly upon us, but most of all the relations which failures of development of all kinds bear to that generalized form presented by lymphatic hyperplasia and its attendant persistence of the thymus.

According to Lespinasse the mental attitude of the eunuchoid varies greatly. Some eunuchoids are distinctly masculine in their outlook on life, while others are decidedly feminine. Their sexual libido as a rule is below normal. Many of the milder grades of eunuchoid individuals marry and apparently get along about as well as other sorts of individuals. The lesser grades may produce spermatozoa of sufficient development to impregnate and consequently have children. There is a tendency in those types to reproduce the eunuchoid type just as there is in the extraordinary early development of puberty to reproduce that condition.

Now a few words on testicles retained in the abdominal cavity. Crew notes that in the more impulsively active animals the testis leaves its primitive position to pass into the scrotum. The process of migration has been shifted back ontogenetically so that now the formation of the inguinal canal and of the scrotum occurs in anticipation of the descent of the testis. The process bears no great relation to either advantage or disadvantage; it is but the inevitable concomitant of other constant features of the animal's existence and has not arisen in relation to ulterior ends.

The testis has become adapted to function in a situation, the conditions of which are markedly different from those of the general abdominal cavity. It can no longer function in the primitive position. The great difference between the two situations is one of temperature. The temperature within the tunica vaginalis is considerably lower than that within the abdomen. The scrotum is so constructed that it is well equipped with a temperature regulating mechanism. The final stages of spermatogenesis occur at a certain optimum temperature which is that within the scrotum and not that within the abdominal cavity. The imperfectly descended testis is aspermatic because the temperature of the abnormal position is not that at which the final stages of spermatogenesis occur.

White and Martin point out that the abdominal retention of the testis may be unilateral or bilateral. The testicle may be found close to the posterior abdominal wall in relation to the lower border of the kidney, it may be provided with a long meorchium allowing it to move freely in the abdominal cavity, or it may lie in the iliac fossa close to the internal ring.

It is possible that the function of the testicles which relates to the conservation of masculinity, as distinguished from the function of reproduction, may be exerted through a definite substance which has distinct physiological properties of its own, manifest to some extent whenever it is introduced into the system. It therefore seems reasonable to hope that regularly repeated injections of testiculin may exert a powerful influence on the general development of bilateral anorchids.

Intersexuality

This term has been introduced by Goldschmidt (1917) and refers to hermaphroditism and pseudo-hermaphroditism. Lipschütz points out that certain individuals combine within themselves characters of both sexes, which is due to the presence of both testicles and ovaries. White and Martin state auto-impregnation, however, has not been observed, or is very rare because, as Bell notes, in structural hermaphrodites the male and female gonads rarely become functional at the same time. The creature plays the part at one time of the male and at another time of a female. It seems certain that total hermaphroditism could not exist in man. The so-called "true hermaphroditism" in man is represented by the variety better known as "glandular partial hermaphroditism." All the recorded cases of this condition which may be accepted as authentic, have been found to possess mixed gonads, so-called "ovitestes," with or without irregularities in the sex-characterization of the genital ducts, external genitalia and secondary characteristics.

In 1873, Klebs, in his classical paper on this subject, claimed that "true hermaphroditism" might occur in the following varieties in man:

(1) Bilateral hermaphroditism, in which an ovary and testis are present on both sides.

(2) Unilateral hermaphroditism, in which there is an ovary or testis on one side and an ovary or testis on the other.

(3) Lateral hermaphroditism, in which an ovary is present on one side and a testis on the other.

Bell suggests that with regard to the occurrence of the gonadal elements of the two sexes in one individual, one would naturally infer, from a developmental point of view, that the different elements would be combined in one organ. In the earliest stages of development, that is, until between the fifth and sixth week, the histological appearance of the gonads gives us no indication as to the future sex-differentiation about to take place. In this undifferentiated stage the gonad is divided into two portions—the capsular epithelium and the central epithelial nucleus composed of "indifferent" cells. Subsequently, if a testis is to be evolved, very soon after this date the cells of the epithelial nucleus immediately underlying the capsular epithelium become condensed and form the tunica albuginea, while the rest of the sex "indifferent" cells, among which the genital cells lie, become arranged in the form of cell masses or cords. These cords, around which and in which the spermatogonia are collected, become the seminal tubules and eventually join the genital tubules outside the gonad.

If, on the other hand, an ovary is in the process of formation, the indifferent cells of the genital cell mass remain undifferentiated longer than in the case of testicular development, and they never become arranged in cell masses or cords. Instead, the epithelial nucleus becomes broken up by branching septa of ingrowing connective tissue, which divide the ovary into a meshwork of compartments. The tunica albuginea is formed by the meeting of these septa beneath the capsular epithelium. Ultimately, most of the indifferent cells degenerate, and the spaces they previously occupied in the meshwork of connective tissue become filled by ingrowths from the septa. The interstitial cells of the ovary are derived from the connective tissue stroma.

In these circumstances the genital tubules outside the gonad atrophy, and their remains may be recognized, extending from the hilum of the ovary through the mesovarium into the mesosalpinx, as the epoöphoron.

If there be any hesitancy in the primary determination of sex, seminal tubules may commence to develop in the epithelial nucleus, even though they do not become functional in the ordinary sense of the word, and the testicular interstitial cells may develop around them. But if masculine genital cells are absent and female are present, the interstitial cells around the tubules cannot arise from genital cells, nor can there be any spermatogenesis.

Bell believes that in the etiology of partial hemaphroditism lies hidden much of the mystery which surrounds sex-determination. Furthermore, he calls attention to the fact that especially in the absence of active genital cells, the gonads may be described as more or less indifferent organs in the matter of sex-characterization. It is probable that the other organs of internal secretion must be admitted into the circle of primary characteristics, and that they usually act in conjunction with the functional gonad, but often quite independently of it.

It is also a fact that the mental attitude and instincts of

partial hermaphrodites accord with the predominating sexual characteristics.

As a matter of fact it is questionable if hermaphroditism is an individual entity. To a large extent the mentality of the average person is hermaphrodidic regardless of the development of the sex organs. Looked at from a logical standpoint it might be considered strange if this were not the case, for, after all, the child must inherit characteristics of both parents. This same assertion to a large degree may be applied to the human body, and it is only when the hermaphroditism extends to the genital organs, causing acutal malformation, that we recognize the individual as an hermaphrodite.

It has long been known that the ovary, like the testis, exerts a profound influence over the metabolism, and that the extirpation of that organ, no less than castration in the male, leads to very distinct results. Marshall recalls the fact that in the human female double ovariotomy, if carried out before puberty, besides preventing the onset of puberty and the occurrence of menstruation, produces noticeable effects on the general form and appearance, as may be seen in women in certain parts of Asia, where the natives perform this operation upon young girls. Such women are devoid of the characteristics of their sex, and certain cases present resemblances to man.

In some female animals, also, the removal or incomplete development of the ovaries has led to the appearance of male characters.

Numerous instances of this have been recorded. It woud appear possible that the secondary male characters are normally latent in the female, and that the ovaries exert an inhibitory influence over their development.

Ovariotomy performed subsequent to puberty in women produces less marked results than when carried out in early life. The most noticeable effect is the cessation of menstruation, and this is sometimes accompanied by an atrophy of the breasts or a tendency towards atrophy.

Most authorities are agreed that the uterus undergoes atrophy after the removal of the ovaries in adult life, and that castration in children and young animals arrests the development of the uterus. These results are usually ascribed to the absence of ovarian influence.

Conclusive evidence in support of the theory that the ovary is an organ of internal secretion is supplied by the results of ovarian transplantation.

Pflüeger advanced the theory that menstruation is brought about by a nervous reflex, owing its origin to the pressure of the growing graafian follicles upon the nerve endings in the follicles.

But there are facts that indicate that menstruation is not caused by a nervous reflex set up by ovulation or by the pressure of the growing follicles. Gynecologists have pointed out that in the human subject ovulation and menstruation are not necessarily associated.

Whereas the evidence that menstruation is not brought about by nervous reflexes arising from the ovary, it is equally obvious that these processes are dependent upon some ovarian influence. Some authors have denied this and cases have been cited of the occurrence of menstruation after surgical ovariotomy. It seems that these exceptional cases are to be explained on the supposition that the extirpation of the ovarian substance was not quite complete and that the tissue that remained behind underwent hypertrophy subsequent to the operation.

Various theories have been put forward to explain the formation and presence of the corpus luteum. According to one view, the development of this structure is merely a result of the excessive vascularization which characterizes the internal genital tract during the period of pregnancy. Marshall argues that very little consideration of the actual facts is needed to convince one of the inadequacy of this explanation.

Prenant (rev. Gen. des Sciences, 1898) was the first to suggest that the corpus luteum was a ductless gland. He supposed it to produce an internal secretion which exercised an influence over the general metabolism in the manner attributed to the internal ovarian secretion. The phenomenon of chlorosis was explained as being due to the absence of this secretion. He supposed also that the corpus luteum had the further function of preventing ovulation during pregnancy.

Beard independently suggested that the corpus luteum is a contrivance to suppress ovulation during pregnancy, while he supposed it to degenerate before parturition in order to admit of ovulation occurring immediately afterwards.

Born suggested that the function of the corpus luteum might be to provide an internal secretion which assisted in the attachment of the embryo to the uterine mucosa. This theory was put to an experimental test by Fraenkel. These experiments resulted in supporting the view that there is an intimate connection between the presence of the corpus luteum and the occurrence of pregnancy, and that this connection is, in a certain sense, one of cause and effect. Apart from this, Fraenkel adduces other facts that tend to support the theory that the corpus luteum is an organ of internal secretion.

Gotte reports a series of observations on the histological character of ovaries removed from women at different periods of menstrual cycle. The results lead the author to believe that the corpus luteum does not play a predominant role in the initiation of the menses, and that if a secretory factor is at work it probably takes its origin from the different ovarian elements. Moreover, it frequently happened that shortly after the removal of an ovary with a ripe follicle menstruation appeared. From their experiments, Bouin and Ancel conclude that the characteristic changes which take place in the mammary gland and the uterus in the beginning of pregnancy are caused by the corpus luteum.

But the physiological relationship between the corpus luteum menstruation is and the corpus luteum gravidatatis have also been proven. Hitschman and Adler have shown that about ten days before menstruation the uterus undergoes changes characteristic of the beginning of pregnancy.

Lipschutz asks, "Is there an influence on the part of the seminal vesicles and prostate gland on the somatic characters and the psycho-sexual behavior?"

This question was discussed by Tarchanoff (1887) in relation to the seminal vesicles; a similar question was recently raised in connection with the prostate gland.

It has been stated that the seminal vesicles and the prostate have no influence on the sex characters. Furthermore the experiments of Kölliker, Fürbringer, Steinach, Nussbaum, Exner, Hirokava and Wischnewsky have shown that the seminal vesicles and the prostate have distinct functions apart from the production of horomones.

The part played by the prostate in normal sex function was discussed by the writer in a paper published in 1925. *In this article I endeavored to show that the internal secretion of the prostate gland was a necessary adjunct to normal potency.* COMPLETE *removal of the prostate gland was followed by a marked impotence, relieved when the patient received injections of prostatic extract.*

Lane has asserted that the prostate is not only an organ of internal secretion, but that its contribution to the seminal discharge is absorbed from the vagina with beneficial results to the woman.

Serralach and Pares have adduced evidence that the prostate controls the testicular functions and regulates the process of ejaculation. It is asserted that when the prostate is removed spermatozoa are no longer produced in the testis and that the secretory activity of the accessory genital glands ceases. Marshall states that it is arguable that the prostate may originally have formed part of the testis, and subsequently have become differentiated as a separate organ in the course of phylogeny.

Reference may be made in this connection to the somewhat similar theory that the ovarian functions are dependent on a similar secretion arising in the uterus. Furthermore, the close relation of the ovary to the mammary gland is a well established fact. The mammary gland develops hand in hand with the ovary at the time of puberty; the glandular structure of the mammary atrophies at the time of menopause; this atrophy also follows oöphorectomy.

Glandular Dominance

Garrettson emphasizes that there is an active interrelationship of all glandular function, and in interpreting cases it is necessary to bear this in mind. Studies have proved, clinically, that certain physiological and structural markings are constant to certain glandular types. Physiological, psychological and morphological changes are observed in all individuals resulting from normal as well as pathological glandular influences.

The thymus ceases to function at the developmental epoch, when gonadal activity begins. The delay of gonadal function with persistent and overactive thymic influence expresses itself in the production of persistent and excess juvenility. *Overactivity of the thyroid before the development epoch creates the prematurely old appearing individual—the little old man, the Lilliputian type.*

Physiological and structural changes at developmental and menopause epochs in both sexes are examples of glandular control. The influence of the pituitary gland upon structural conditions is demonstrated when hypersecretion of the anterior lobe occurs, creating before puberty, gigantism, acromegaly during adult life, and shrinking in old age. The extremes of thyroidal secretion create Basedonian characteristics.

Interpretation of endocrine types enables us to prognosticate disease predisposition, when we possess a knowledge of tropism-so-called. Immunity processes are so explained.

Crofton calls attention to the fact that every cell in the body is under the control of the nervous system, under the dominance of which it carries on its normal activity. All development is a response to environmental influences. The glands producing internal secretions have been developed in response to a change of surroundings and to enable the animal to survive in this altered environment, those developing a secretion surviving. The pancreas is the most fundamental and produces an internal secretion which is clearly different in function from hormones. At any time after birth, failure of the internal secretion of the pancreas is rapidly fatal, as is also failure of the next most primitive, the pituitary and the suprarenals.

The endocrine organs are not only interrelated but interdependent in function. Haldane says, "a disturbance in the function of one of these organs involves a disturbance in the function of a larger or smaller number of others."

Menstruation means the process which manifests itself in the human female after the age of puberty by the discharge from the genital organs at regular four-weekly intervals of a muco-sanguineous secretion.

This discharge is not merely local but a general phenomenon in which the woman's whole organism participates; pulse, blood pressure, temperature, muscular power and pulmonary capacity are increased before the occurrence of the hemorrhage, while at the onset and during the flow they fall below the normal level.

The blood discharged during menstruation has certain peculiar properties. It is alway fluid, and rarely contains fibrinous clots; it is always mixed with a larger or smaller quantity of mucus; the reaction is alkaline, the odor characteristic. Only when the bleeding is very profuse are coagulated masses evacuated. At the beginning of each menstruation the admixture of mucus is greatest.

The quantity of blood lost at each period is said to vary from 90 to 240 grams.

The commonest type of menstruation is the more or less regular recurrence of the flow at intervals of twenty-eight days. In general it may be said that in persons of strong constitutions, the type of menstruation is much more regular than in persons of delicate, weekly constitution.

The corpus luteum, beginning its life history at the time of ovulation, passes through a series of developmental changes which reach their acme just before the onset of the next menstrual period. Hand in hand with this development of the corpus luteum there proceeds a similar hypertrophic change in the endometrium, also reaching its high point just before the onset of the next period. The clinical phenomenon of menstruation with its discharge of blood is indicative of a catabolic process in the endometrium, when conception does not occur. It is a transition of the endometrium from the highest to the lowest point of its development. On the other hand, if the ovum has been impregnated, the premenstrual hypertrophy of the endometrium passes on by easy stages into the formation of the early decidua.

While the corpus luteum is essential, it is not the cause of the actual menstrual hemorrhage. The corpus luteum prepares the endometrium for the reception of a possible impregnated ovum.

The actual menstrual discharge is synchronous with the beginning of retrogression in the corpus luteum. The influence responsible for this has not yet been determined. There is reason to believe that it is associated with the ovum discharged at the previous ovulation.

To sum up, the prevailing theories of menstruation: (1) that it is a cyclic throwing-off of a portion of the endometrium; (2) that it is due to the maturing of a graafian follicle with the resulting corpus luteum; (3) that it is caused by an internal secretion; (4) that it provides a rich pabulum to nourish the embryo. Young holds that menstruation is a function established to provide blood albumen as support and possible nourishment for an ovum during the predecidual period.

412 West End Avenue.

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Blood Uric Acid and Precordial Stress*

MILTON A. BRIDGES, M.D.

New York

The following facts have been gathered as a result of an observation of an angina pectoris fatality in a case, male, 30 years of age, who had been subjected to a thorough physical examination, electrocardiographic tracing, complete chemical blood analysis, urine analysis and Basal metabolic determination. In addition, consultation of the highest calibre had been obtained. The only finding which in the slightest degree differed from normal was that of a mildly elevated blood uric acid.

Following the above incident, perusual of both private and hospital records was made of all cases that had complained, or still complained, of precordial stress. This large group of cases was still further restricted in so far as out of all the cases of precordial stress only those in whom a blood uric acid and blood urea had been determined were selected. In addition, further restriction was made in selecting only those cases in which blood urea nitrogen was considered relatively within normal limits.

In looking over the data as graphically presented, it will be noted that in rare instances there is an elevation of the urea. Upon further observation, it will be noted also, that these instances are a later admission to observation of the same case, which had previously showed no elevation of urea, but slight or great elevation of uric acid. No respect was shown to age or sex. Naturally, the provision of the restriction above noted cut down the number of cases to be accumulated, so that there was not as great a number as might have been expected. This chart is a presentation, in brief, of the series of cases, the records of which have been studied. Upon observation of the above series of cases, it is to

No.	Name	Age	Diagnoses	Symptoms	Dur.	First Obsvtion.	Termntion	Bl. Pr. I	Bl. Pr. II	Uric A.	Urea N.	Sugar	Urine	Chm.Bl.Findgs.	Wt.
	K. H.	53	Chr. Muc. Colitis Hypertension Chr. Hypmtrpia Mycoard-Insuff.	Dyspnoea Pain in heart	1 yr.	9-16-25	Improved	184/102		3.75	16.5	.133	Fnt. Tr. Album		130/50
	J. B.	63	Diab. Mellitus Bi-lat. Hernia Ang. Pectoris	Typical Angina	2 wks.	10-17-25	Improved	118/82		3.6	11.3	.181			220/50
	C. M.	69	Ang. Pectoris Gen. Art'scler. Intermittent Claudication Obesity					158/80	144/75	5.00	15.0	.130	Negative	Creatnine 1.66	201/0
	M. M.	50	Hypertension	Heaviness aro'nd heart		10-12 10-18-24	Dead	110/84	120/92	5.1	12.6	—	Negative		177/50
	(D)		Obesity Ang. Pectoris		Days										
	L. B.	33	Obesity Ang. Pectoris	Pain over heart	1 mo.	2-18-25	Unimp.	118/98		5.45	14.5	—	Negative		170/50
	M. H.	66	Ang. Pectoris Aortic Dilat. Card. Hypertr. Card. Dilatat.	Pain over heart Typical Angina	1 wk.	2-17-25	Dead	164/78	164/84	4.28	16.0	.125	Fnt. Tr. Album Nod No Hyalin Nod No Uric Acid Crystals	Creatnine 1.50	156/50
	M. K.	42	Ang. Pectoris Chr. Cholecyst. Hypertension Myocard. Insuff. Obesity	Dypnoea Pain over heart	1 yr.	6-30-25	Undet.	260/150		4.3	18.4	.127	Negative	Creatnine 2.2	162/75
	Mrs. S.	62	Ang. Pectoris Chr. Cholecyst. Diab. Mellitus	Severe pain over heart	7 hrs.	7-6-25	Improved	134/78		4.28	22.5	.333	Not obtained		160/0
	J. C.	34	Ang. Pectoris Chr. Myocard.	Aching arm and chest	3 yrs.	12-3-25	Dead	120/80	122/82	4.0	15.0	.100	Negative		
	O. C.	47	Uric Acid Diath. Vent. Hernia	Str. over chest	6 mo.	1-30-24	Improved	122/78		4.0	15.6	.100	Negative		147/75
	E. H.	49	Abd. Angina Chr. Cholecyst. Migraine	Fainting & sinking sensations	3 yrs.	2-27-23	Improved	160/90	128/60	4.3	17.25	—	Negative		
	T. K.	46	Ang. Pectoris	Pain lft. breast and chest	1 yr.	6-15-23	Undet.	128/80		5.0	21.0	.144	Negative	Creatnine 1.8 Chlorides 0.450	
	J. McE.	69	Chr. Myocard. Uric Acid Diath. Hypertension	Sharp pn. in & around heart	1 mo.	1-19-24	Improved	180/110	165/98	4.29	16.87	.090	Negative	Creatnine 1.50	179/0
	J. T.	38	Uric Acid Diath.	Shtness breath Press. over heart	1½ mos.	6-27-23	Improved	120/76		4.00	12.0	—	Negative		132/50
7753	S. L.	65	Ang. Pectoris Chr. Myocard.	Cyanosis Gripping pn., extend. shld. & arm to finger tips both hnds.	About 18 mo. 10-29-25	11-16-25	Un-impr.	120/80		4.2	9.5	.091	Negative	Chlor. 0.503 CO_2 53.2	About 140/
8811	J. B.	38	Obesity Ang. Pectoris Dyspituitrsm	Pain in chest Dyspnoea Typical Angina.	12-7-25 5 mos. 10 days	12-10-25	Un-impr.	130-94	124/70	5.0	7.0	.085	Fnt. Tr. Album Sp. Grav. 1.030 Microsc.-Neg.	Chlor. 0.503	192/50
2896	L. F.	50	Hypertension Ang. Pectoris Chr. Myocard.	Pain over chest Shtness breath	About 3 mos. 6-2-25	7-8-25	Improved	200/150	214/140	5.2	16.1	.123	Mod. Amt. Album Sp. Grav. 1.026 Microsc.-Neg.	Chlor. 0.494	170/00
5641	T. N.	43	Ang. Pectoris Chr. Myocard. Art'sclerosis	Pn. in precord. radiating to lft. shlder & left. arm.	About 11 mos. 8-21-25	9-21-25	Improved	130/72	130/72	3.6	10.0	—	Trace Album Sp. Grav. 1.028 Microsc.-Neg.		155/00
41562	P. S.	64	Obesity Hypertension Diab. Mellitus Chr. Constipation	Negative Cardiac	—	5-17-24	Improved	205/96	114/64	5.3	13.4	.336	Albumin Pus cells	Chlroides .450 CO_2 58.9 Haemgl. 12.0	
49064	P. S. (D)	64	Cor. Thrombosis Obesity Hypertension Diab. Mellitus Chr. Constipation	Substernal pain (4 mo. duration)	5 mos.	1-16-25	Dead	120/78	92/62						

No.	Name	Age	Diagnoses	Symptoms	Dur.	First Obsvtion.	Termntion	Bl. Pr. I	Bl. Pr. II	Uric A.	Urea N.	Sugar	Urine	Chm.Bl.Findgs.	Wt.
46300	R. K.	65	Bronchial Pain Mitral Regurg.	Cough, pn. chest, tmp. Short. breath, 10 years	—.	10-10-24	Improved	106/72	102/60	3.5	12.3	.111	Chlorides .460	Low Spec. Grav. CO_2 48.6 Chlorides 0.500	
40569	R. K.	65	Ang. Pectoris Cor. Thrombosis	Precordial stress	2 days	2-6-25	Improved	136/88	104/96		9.5	.091			
47890	Y. F.	45	Ang. Pectoris Art'sclerosis Hypertension	Precordial stress Radiation both arms Dyspnoea	1 yr.	12-3-24	Improved	156/98	156/105	—	—	—	Fnt. Tr. Album Few Pus cells		
43517	Y. F.	45	Hypertension Ang. Pectoris Bronchial Pain Myocarditis Ang. Pectoris Neurasthenia Chr. Tonsillitis	Headache—Dyspnoea Sub-stern. pain chest Pn. chest, cough, tmp. Cramp-like pains in heart Pains in arms	1½ yrs.	7-15-25	Improved	162/90	152/100	4.1	15.5	.123	Lge Amt. Album Many Pus cells Hyalin casts Sp. Grav. 1.016 Sm. Amt. Album Few Pus cells	Chlorides 0.513	
49414	N. G.	50	C. S. Lues Ang. Pectoris	Substern. pn. 3 wks. c radiation left neck and arm	3 wks.	1-21-25	Cured	122/66	112/70	4.9	15.0	.087	Sp. Grav. 1.027 Straw color Alkaline	Chlorides 0.463 CO_2 54.8	
	Note:—		Bl. Wass. 4+ Sp. Fld. Wass. 4+	Aortic type heart in X-ray											
41345	M. D.	37	Obesity Ang. Pectoris Diab. Mellitus	Pn. lft. chest, shoulder Dyspnoea, 3 yrs. Sugar, Ur. past 2 yrs.	3 yrs.	5-10-24	Improved	120/76	122/74	4.6	9.5	.219	Sp. Grav. 1.030 Negative	Chlor. 0.450 Haemg. 13.9 CO_2 57.0	247/0
46785	H. W. (D)	62	Diabetes Art'sclerosis Hypertension Ang. Pectoris	Mid-Epigastric pain Dyspnoea Str. over left chest	2 yrs. 10-25-24	11-3-24	Dead	221/42	—	3.0	11.0	.334	Sp. Grav. 1.026 1.4% Sugar 4. Acetone 4. Diacetic	Chlos. 1.76 Visco. 5.5 CO_2 50.4 CO_2 Com Pr. 63.8	108/0
25108	C. G. (D)	61	Chr. Myocrditis Ang. Pectoris	Str. over chest	9-30-17	10-9-17	Dead	110/75	135/97	5.4	—	.141	Epith. cls & Leuc. Few Hyalin casts		
37449	A. N.	50	Ang. Pectoris Cor'sclerosis Myocard. Degen.	Pn. in heart—5 days	5 days 12-25-23	1-12-24	Improved	110/72	115/75	4.1	19.5	.186	Negative	CO_2 62.4	137/75
38190	M. K.	70	Ang. Pectoris Art'sclerosis Chr. Myocrditis	Str. over chest (3 months)	3 mos. 1-22-24	2-25-24	Improved	121/74	152/68	4.8	21.4	.124	Mod. Amt. Album Many W.B. Cells		129/0
48719	M. W.	67	Obesity Hypertension Diabetes Ang. Pectoris Myocarditis	Pain left leg Negative Cardiac	7 mos. 1-5-25	2-8-25	Improved	94/62	—	2.5	14.3	.185	Few W.B. Cells 0.5% Sugar	Chlor. 0.47 CO_2 61.7	189/50
622	M. R.	41	Pos. lead pois. Ang. Pectoris	Pn. lft. nip. and shoulder Unconscious spells c premonition	6-8 mos. 3-17-25	3-24-25	Improved	120/80	124/76	3.3	9.9	.085	Fnt. tr. Diacet. & Acetone	Chlor. 0.488 Calcium 10.8 Phos. 4.5	216/0
38667	H. W.	65	Diabetes Art'sclerosis Ang. Pectoris	Pain heart	2 mos. 2-9-24	3-25-24	Improved	166/98	138/74	3.7	16.1	.234	Sp. Grav. 1.040 2% Sugar Negative	CO_2 50.4	140/0
2703	W. K. (D)	59	C. S. Lues Syphilis (C. S.) Ang. Pectoris	Boring pain over lft. chest on exer.	15 mos. 5-26-25	6-4-25	Dead	100/54	98/72	5.2	17.5	.079	Negative	Chlor. 0.500	195/00
623	W. R.	41	Ang. Pectoris Obesity	Pn. in reg. over left nipple Dizziness Unconscious spells c premonition	6-8 mos. 3-17-25 3 wks. 6 mos.	3-24-25	Improved	120/80	124/76	3.3	9.9	.085	Negative	Chlor. 0.488 Calcium 10.8 Inorg. Phos. 4.5 Haemg. 16.5	216/00
	J. C. B.	66	Ang. Pectoris	Typical syndrome on slightest exer.	2 yrs.	5-25	Improved	150/00	—	5.1	18.0	—			About 200/00
	W. S.	51	Ang. Pectoris	Dizziness Typical Angina Pect.	1 yr.	4-6-23	Improved	112/76	142/78	4.0	18.0	.133	Negative	Chlor. 0.511	135/00
	P. D.	28	Ang. Pectoris Hypertension Art'sclerosis	Typical Angina Pect.	6 wk.	12-23-25	Improved	152/144	138/78	3.33	18.5	—	Negative		164/50
	R. H.	67	Ang. Pectoris Obesity Art'sclerosis Aortic Dilat.	Typical Angina Pect.	3 mo.	9-23-25	Improved	146/68	140/58	3.33	17.5	.093	Negative		157/75
	F. K.	46	Ang. Pectoris Art'sclerosis Hypertension	Press. over chest	1 yr.	10-15-25	Un-impr.	190/130	178/128	3.4	16.8	.092	Negative	Chlor. 0.453 CO_2 61.7	135/00

be noted that the mean uric acid reading is 4.77 mgm. per 100 c.c. The corresponding series of uric acid readings of cases, equal in number, indiscriminately selected, other than precordial stress cases, yield a mean average of 3.1 mgm. per 100 c.c. blood uric acid.

In the light of the immense variation as to concensus of opinion in relation to normal blood uric acid determinations, a survey of the various determined normals at different institutions throughout the country was made, with the result that the acceptance of 3.3, as being the upper physiological limit was determined upon.

Considering this figure as the upper limit of a normal reading it may be deducted that in cases of precordial stress there tends to be an elevation in the blood above the upper physiological limit of the uric acid reading. The laboratory work in determining the uric acid reading of the blood in the above series of cases was restricted to two laboratories, one of which was connected with a large hospital and the other a private laboratory.

The respective findings were repeatedly checked in a number of cases by part of the same specimen being sent to each laboratory. The findings of each were in accord, thereby obviating either errors in technic or errors in interpretation of technic, which might arise, in the hands of different laboratory workers.

No attempt should be made, in the light of the meagre information presented above, however, to construe any definite meaning in relation to cause or effect of uric acid and precordial stress. However, these observations as above presented may possibly lead to further clinical and chemical investigation which might yield a further insight into the etiology or results of precordial stress.

In the light of the work done by Lennox and others, we have observed that the uric acid content of the blood in certain conditions may be a very variable factor.

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What Legal Remedy Has a Consumer of Impure Food?*

FREDERICK A. FULLHARDT, ESQ.,
MEMBER OF THE NEW YORK BAR,
New York

The purpose of this paper is to present briefly the legal remedy of a person injured by the consumption of impure food, and I might say here, that throughout this paper, I shall confine myself to the law of New York State as laid down by the decisions of our Courts.

Perhaps it would be better at the outset to define impure food as food containing substances that are foreign to the ingredients natural to said food, as well as food containing ingredients which in themselves are impure. A nail baked into a loaf of bread, glass in ice cream, poison in milk, or putrid meat are all contained in the category of impure food. A man purchases an article of food, and, after eating it, becomes ill. He believes that his illness is caused by a poisonous substance contained in the food consumed by him. Or, perhaps, he is injured by reason of biting on a nail, or cutting his tongue on a piece of glass imbedded in the food. He has suffered damage from one cause or another, and he wishes to know what legal remedy he has against him to whom he attributes his damage.

In food cases there are two theories which may be pursued in bringing suit for damages: One, an action on contract on the theory of implied warranty; and the other on the theory of negligence, a tort action. In sales of personal property an implied warranty is one which, while not being expressly made by the seller, the law implies by the facts of the sale. The case of *Van Bracklin vs. Fonda*, reported in *12 Johnson 467*, and decided in 1815, is the earliest case in this State on the question at hand. Fonda sold a quarter of beef from a cow which he knew was diseased and about to die. Although that case was decided upon the fact, as settled by the jury, that the defendant knew the animal to be diseased and unfit for food, yet it was repeatedly cited by a long line of cases down to the case of *Race vs. Krum (222 NY 410)*, in 1918, as authority for the doctrine that the vendor of the food impliedly warranted its wholesomeness and fitness for human consumption, because he was presumed by the practice of his calling to have the requisite skill for the detection of impurities or foreign substances in the product sold by him.

In the case of *Race vs. Krum*, Race went into the drug store operated by Krum and bought a dish of ice cream, which he ate at the drug store counter, and, after eating same, became ill. Suit was brought, and the Court of Appeals held that accompanying all sales by a retail dealer of articles of food for immediate use there is an implied warranty that the same is fit for human consumption. By this decision a retailer became an absolute insurer to the immediate purchaser of the fitness for human consumption of the food sold by him.

This cause of action arose before Section 96 of the Personal Property Law took effect. That section provides that,—

"There is no implied warranty or condition as to the quality or fitness for any particular purpose of goods supplied under a contract to sell or a sale, except as follows:

"1. Where the buyer, expressly or by implication, makes known to the seller the particular purpose for which the goods are required, and it appears that the buyer relies on the seller's skill or judgment (whether he be the grower or manufacturer or not), there is an implied warranty that the goods shall be reasonably fit for such purpose."

This section modified the decision in *Race vs. Krum* from an absolute implied warranty, to an implied warranty only when the seller makes known the particular purpose for which the goods are required, and it appears that the buyer relies on the seller's skill or judgment.

After Section 96 of the Personal Property Law took effect the Court of Appeals in the case of *Rinaldi vs. Mohican, (225 NY 70)*, held as follows:

"That the mere purchase by a customer from a retail dealer in foods of an article ordinarily used for human consumption does by implication make known to the vendor the purpose for which the article is required. Such a transaction standing by itself permits no contrary inferences."

Thus we find ourselves again governed by the law of *Race vs Krum*, because if a retailer by implication knows the purpose for which the article is required, there is the implied warranty that the same is fit for human consumption. Whether this warranty extends to a wholesaler or manufacturer who is not the immediate vendor was expressly reserved in the Rinaldi case, and not at issue in the *Race vs Krum* case, but was squarely presented in the case of *Chysky vs. Drake Bros.* in *235 NY 468*.

In that case, the plaintiff was employed as a waitress in a lunch room and received from her employer, as part of her lunch, a piece of cake which had been made and sold to him by the defendant Drake Company. While she was eating it, a nail baked into the cake, in such a way that it could not be discovered by inspection, stuck in her gum, which became so infected as to necessitate the removal of three of her teeth. The waitress sued the cake manufacturer on the ground that the manufacturer had impliedly warranted, when the cake was sold, that it was fit for human consumption and that such implied warranty inured to her benefit. The Court of Appeals held that there was no such implied warranty because,—

"if there were an implied warranty, which inured to the benefit of the plaintiff it must be because there was some contractual relation between her and the defendant and there was no such contract."

And again,

"The general rule is that a manufacturer or seller of food, or other articles of personal property is not liable to third persons, under an implied warranty, who have no contractual relations with him. The reason for this rule is that privity of contract does not exist between the seller and such third persons, and unless there be privity of contract, there can be no implied warranty."

That is to say, the third person has no part in the contract between the manufacturer and the retailer.

Thus we have the law that in the purchase of food the retailer impliedly warrants its fitness for human consumption, and that there is no such warranty by the manufacturer to the purchaser. Let us take an example of sealed goods, as a can of peaches. Under the law there is no implied warranty between the manufacturer and a third party, because there is no privity of contract. Yet how may the retailer be held on implied warranty when he has no opportunity of examining the product sold by him? Shall the arrangement be that the purchaser may recover against the retailer and the retailer in turn recover against the manufacturer? But if this condition be allowed in sealed products cases, is it fair to

* Read before the Society of Medical Jurisprudence, February 8, 1926.

the manufacturer to bind him by a state of facts as found by a jury in a court in which the manufacturer has not had his day? We can see possibilities of confusion and injustice if we follow the law as an iron bound rule.

An answer to these questions was given by the Appellate Division, First Department, in the case of *Aron & Co. vs. Sills (211 A. D. 21)*. This was an action by the buyer for breach of warranty of the quality of condensed milk which the seller purchased from a manufacturer for export. The question here was whether a wholesaler or middleman is liable upon an implied warranty that food which is purchased from a manufacturer and sold for human consumption was wholesome and fit for the purpose intended. The court held that the middleman is liable, and "would have recourse over against the manufacturer for reimbursement of the damages which they had suffered as the result of the faulty fabrication" of the product sold to the middleman by the manufacturer.

"If we were to hold that there was no implied warranty as between the middleman, the defendants here, and the plaintiff, then the plaintiff would have no cause of action against the manufacturer of the milk because of the non-existence of any contractual relation with such manufacturer. If that were to be established as the law, then any manufacturer of foodstuffs could put upon the market inferior or even poisonous goods and, if sold through a middleman to a customer, the consumer would have no remedy whatsoever against any one."

This is an example of the confusion existing as to these cases. The court in rendering this decision, which might well be termed one of convenience, made a provision for a remedy on implied warranty. Unless the court held as it did, in this case, there would have been no remedy on implied warranty.

Let us follow it through—suppose the plaintiff here had sold the unfit food to a consumer and the latter became ill as a result of eating the food. Under *Chysky vs. Drake,* he would have no cause of action on implied warranty against the manufacturer. Under *Aron vs. Sills,* he would have such a cause of action against the retailer with the accompanying reimbursements up the line, but we would err in saying that except upon implied warranty he would have no remedy against a manufacturer of poisonous food because he would have a cause of action in tort—for negligence.

As resumé of the doctrine of implied warranty, I will present an actual occurrence and apply the law of the cases above mentioned to the facts. I saw a lady open a can of spinach, in which were found two pieces of coal and the neck of a bottle. What remedy has she on the theory of implied warranty? She has no cause of action against the manufacturer, because there is no contractual relationship between her and the manufacturer. The retailer would be liable to her as an insurer of the wholesomeness of the food sold by him; and he in turn may sue the manufacturer for reimbursement, by virtue of the decision in *Aron vs. Sills.* Suppose the lady had not seen the glass and had been injured by it. Then she would have a cause of action in negligence against the manufacturer.

A tort action will lie against a manufacturer for negligence. Where the food sold is not sealed and the retailer is in a position where his negligence could cause the presence of a foreign substance in the product, just as well as the manufacturer. we have a condition where recovery against the manufacturer is difficult. A consumer purchases a plate of ice cream from a retailer, and injures his mouth on a piece of glass hidden in the cream. The glass might have fallen into the cream due to the carelessness of the manufacturer, or retailer, or a third party. The rule is well settled that exercise of care is only required to prevent accidents which are to be expected according to human experience, and it stands to reason that an injury due to glass concealed in a dish of cream is one which ordinarily human forethought cannot foresee. If the manufacturer shows the use of such care, and the possibility of third persons or the retailer being the negligent party, then the jury should not be permitted to speculate as to the precise time and place that the glass came into the cream.

This brings us to the consideration of the question of *res ipsa loquitur. Res ipsa loquitur* means that the thing speaks for itself and is a phrase often used in actions for injury due to negligence where no proof of negligence is required beyond the accident itself, which is such as necessarily to involve negligence. The doctrine of *res ipsa loquitur* applies where there is a state of facts from the existence of which in themselves without any proof whatsoever, except as to their occurrence, there arises an immediate presumption of negligence on the part of the person causing such facts to exist. For example, there is shipped from a manufactory a garment containing a needle which was used in the manufacture of that garment. A purchaser of the garment is injured by the needle. The presence of the needle raises an immediate presumption of negligence on the part of the manufacturer for neglecting to remove the needle.

Judge Spiegelberg, in the case of *Jacob vs. Childs Co., (166 N. Y. S. 798),* rendered a decision as to *res ipsa loquitur,* which as yet has not been disturbed. In that case Jacob, while a guest in one of the eating places maintained by the defendant Childs Co., ordered a piece of cake. While eating the cake the plaintiff bit upon a metallic nail which was concealed in the cake. The cake was baked and prepared by the Childs Co. The question for consideration was whether the fact of the presence of the nail is sufficient to charge the Childs Co. with negligence. There was no question as to the wholesomeness of the food or the purity of the ingredients used therein. The gravamen in this case was that a foreign substance in no wise connected with the preparation of the cake caused injury to the plaintiff. The plaintiff Jacob failed to show any negligence on the part of the Childs Co. beyond the fact of the presence of the nail in the cake. Held, that the doctrine of *res ipsa loquitur* does not apply. If we could suppose that nails are necessarily used in the baking of cake or were an integral part thereof, a different situation would be presented. If causes other than the negligence of the defendant might have produced the accident, the plaintiff is bound to exclude the operation of such causes by a fair preponderance of the evidence. Would the spinach case be one where we could apply the doctrine of *res ipsa loquitur?* Coal is not used in canning food, and spinach does not grow in bottles; yet the can was sealed before it left the control of the manufacturer. According to the decision in *Jacob vs. Childs,* this would not be a case in which the doctrine of *res ipsa loquitur* could be applied, and negligence would have to be proven.

There are two types of cases where poisoning is alleged as a result of consuming the food. In the first type a foreign substance of poison sufficient to cause the illness is actually found; and in the second type nothing is found. Where a substance deleterious to health is discovered the medical testimony is quite correct in telling what substance was found and what ill effects if any upon the system of the plaintiff said substance would produce; but then the presumption is that the manufacturer was the cause thereof. This, too, must be proven and, unless there does happen to be a case which should be decided by the doctrine of *res ipsa loquitur,* the rule of *Jacob vs. Childs* applies. In the case where no

poisonous substance is found upon analysis, or no analysis is made, there is a double presumption; that is, the presumption that a harmful substance must have been in the food to cause the illness, and the presumption that it must have found its way into the food due to the manufacturer's fault. This is not proof, and the jury is not permitted to speculate upon and juggle the testimony so as to single out the negligence of the manufacturer. And yet how many cases are tried with the plaintiff basing his entire case on a double presumption.

In conclusion, I should like to say that the confusion now attending the application of the doctrine of implied warranty to these food cases would be lessened materially if the courts were to hold that—"There is no implied warranty of the wholesomeness of a food where the seller has no knowledge of its unwholesomeness and no means of obtaining such knowledge except by a bacteriological or chemical analysis". This would remove the burden from the shoulders of the retailer who is in a position where he cannot discover a defect in his product, and at the same time the consumer is not deprived of his rights because he has his remedy in tort against the manufacturer.

Discussion

Axel Josephsson, Esq.: I should like to ask one question as to the *Jacob vs. Childs Co.* case. According to the speaker the Childs Co. were not liable for damages; still they sold the cake as well as manufactured it. Why, under the decision in *Race vs. Krum* where the retailer was held responsible for the food sold being fit for consumption, would they not be responsible for selling cake containing a nail? They manufactured the cake, but they also sold it in their restaurant. Why did not Jacob win his case on bringing suit against the retailer?

Mr. Fullhardt: The reason for that decision was that Jacob sued on the theory of *res ipsa loquitor*. He did not prove negligence on the part of the Childs Company, and the reason is because a nail is not ordinarily used in baking cake. If a substance not ordinarily used in baking cake is found in that article of food, then the plaintiff must prove actual negligence on the part of the defendant. The decision was not based on right but on the theory on which he brought his action. If he had brought it on negligence he could have won his case.

Mark Aaron, Esq.: If a man went to a restaurant and purchased a meal for himself and his wife for which he paid and his wife subsequently became ill, could she recover damages from the restaurant on an implied warranty?

Mr. Fullhardt: I will go you one further. Suppose I go to a store and buy a quart of ice-cream and take it home intending to eat it with my family. I receive a telephone call and have to leave the house immediately without tasting the cream. A friend comes in while I am gone and is asked to partake of the ice-cream which contains some substance which injures him. I made the contract with the retailer for the ice-cream, gave it to my family and they offered it to a friend and he was injured. How can there be implied warranty here? He can in that case sue only on the theory of negligence.

Dr. Harry G. Goldman: Negligence cases must be distinguished from *res ipsa loquitor* cases. Where a man is injured by the explosion of a boiler that is sufficient proof that an accident occurred. One knows that injury will result. The presence of nails or glass in food does not imply injury; the buyer may see it and remove it. If it were not for such decisions a big field would be opened for litigation.

Walter Jeffreys Carlin, Esq.: There have been closer decisions than this. In one the bursting of a soda-water bottle was held not to be sufficient proof of negligence; there had to be some proof of negligence in the manufacture of the bottle. Then there was another case where the bursting of a gun was not held to be sufficient. In fact, you will find this in every case based on a question of negligence. For example, a needle was found in a cake of soap, yet it was not proven to be there through negligence and no recovery could be had. So you see we have a confused state of affairs.

Albert S. Bard, Esq.: I think Judge Spiegelberg's decision is illustrative of one of the things in jurisprudence that laymen, and even lawyers, often criticize. Regardless of the technical correctness of that decision, of which there is doubt, it contradicts the common sense of everyone. The theory seems to be this: If nails were naturally found in the machinery for making cake, negligence would be predicated on the part of the manufacturer if a nail escaped from the machinery and got into the product. The fact will speak for itself then, and negligence will be proven. In other words, the theory seems to be, the more foreign the substance and the more unlikely it is to get into the cake, the less is the likelihood of negligence, if it does in fact get in. But the precise contrary is true. Someone has been extremely negligent, and the more alien the foreign substance the more likelihood is there of having been negligence.

Lawyers ought to criticize a decision of that sort. Decisions should go less on technicality and more on common sense—common sense in the application of the law to life. This decision is but one illustration of that ultra-technical dealing which seems to be a constant temptation to a conservative profession or institution like that of jurisprudence. What the law can do is consciously to bring to bear considerations of common sense, and eliminate technicalities and help the orderly evolution of jurisprudence. It should reduce the number of absurd decisions of that sort, as not being really good law, because they are contradictions of the fundamental operations of the human mind.

Mr. Fullhardt: That was a case of proven negligence.

Mark Aaron: At the present time it is apparently difficult to recover in any case of poisoning by a foreign substance in food.

Mr. Fullhardt: It is not so difficult against the retailer but it is against the manufacturer. If you bring action on negligence against a manufacturer you cannot say that it was not the retailer's fault that the foreign substance found its way into the food. It is very difficult to prove your negligence against the manufacturer and proof must be shown in order to recover. Judge Spiegelberg says that if a foreign substance gets into food through some third party that must be disproven or shown not to have existed before you can prove negligence against the defendant manufacturer.

Albert S. Bard, Esq.: Now there is another illustration of what I referred to, where the law is too technical and justice miscarries. The maxim, "the thing speaks for itself," should more often operate to shift the burden of proof. The patron who buys the cake and the nail in it has no proof of who made the cake or how it was made, and no more chance of producing such proof than the chance of the proverbial snowball has in the proverbial place where there are no snowballs. Childs has the proof at hand to show the conditions under which the cake was made. There may be failure to establish lack of negligence on Childs's part, but the burden of proof ought to lie on Childs, and not on the patron. In the absence of proof of no negligence, i. e. of the exercise of care, negligence should be made out as a *prima facie* matter by the mere finding of the nail. The matter of false claims should be met directly, and by methods specially directed toward that issue, rather than indirectly and by adoption of a false theory designed to reach the same end, because the false theory gives rise to new difficulties and is itself indefensible on its own merits. My plea, as a lawyer, is for more simplicity, directness and intellectual honesty in the development of legal theory.

Mark J. Katz, Esq.: Suit was once brought successfully against an hotel in this city by a guest who while eating a kidney stew found therein parts of a mouse. The guest recovered $1,000. On appeal to the Appellate Division it was held that a hotel keeper implied warrants that food prepared by his servants, and served in his restaurant to a guest, is wholesome to eat, contains no deleterious matter, and is the food ordered; and he is therefore liable for sickness to a guest as the result of the presence of the mouse in his kidney saute. The defence sought unsuccessfully to prove that the plaintiff, who was an actor and who was seeking employment at the time in the motion picture business, had really placed the mouse in the dish himself. This interesting case may be found in 184 Appellate Division reports.

Meyer Levy, Esq.: I think that in the *Jacob vs. Childs* case the plaintiff ought to have been contented that his jaw was not broken by the legal maxim. The case was a breach of warranty. The form of complaint stands for legal trickery and should not have affected the results at all. It was based on implied warranty and there was an established cause of action. The mere fact that the plaintiff's attorney gave it the wrong handle should not have affected the results at all. I am surprised that Judge Spiegelberg rendered such a decision. Most of us who are here will not be alarmed by it. We still have cause of action against Childs if we get a nail in a piece of cake purchased from them.

Dr. Harry G. Goldman: In the hotel case, just mentioned by Mr. Katz, the plaintiff was a guest of the hotel and found in his food a piece of a rodent. He called the manager, changed his plate and ordered soup. In the soup he found another piece. The court found in this case that there was an implied warranty because he was a guest of the hotel.

Dr. Bernhard S. Talmey: Is there no such a defense as an unavoidable accident? Suppose nails were used in the baking of cake. During the operation of laparotomy a number of surgical pads are used. All precautions are used; the nurse counts the pads before giving them to the surgeon and after they are used.

(Concluded on page 257)

Newer Therapy of Cardio-Vascular-Renal Disease

Discussing the Value of Some Operative Procedures, and Drugs in Buerger's Disease, Angina Pectoris, High Blood Pressure, Heart Failure, and Dropsy (of Cardiac and Renal Origin).

HYMAN I. GOLDSTEIN, M.D.,
ASSISTANT VISITING PHYSICIAN, PHILADELPHIA GENERAL HOSPITAL AND NORTHWESTERN GENERAL HOSPITAL, PHILADELPHIA,
Camden, N. J.
LEOPOLD GOLDSTEIN, M.D.,
Camden, N. J.
and
HENRY Z. GOLDSTEIN, M.D.,
RESIDENT PHYSICIAN, NORTHWESTERN GENERAL HOSPITAL,
Philadelphia

During the past seventeen years We (H. I. G.) have often been confronted in hospital and private practice with cases of various forms of cardic-vascular-renal conditions that did not respond well to the usually accepted kinds of treatment. Only too often have we met with cases of general anasarca, cardiac decompensation, hypertension, with and without general angiosclerosis—with many other annoying symptoms that did not seem to respond to our therapeutic measures.

Thoracentesis, paracentesis, venesection, Southey tubes, spinal puncture (hypertension), various digitalis preparations (digalen, digitan, digitol, digifortis) pilocarpine, strophantin, ouabain, sodium citrate, caffein-sodium-benzoate, nitro-glycerin, quinidine, sulphate, sodium nitrite, morphine, atropine, iodides by mouth or intravenous injection, calcii iodobehena U. S. P. (sajodin), urea, epsom salts 1 per cent (by intravenous injection), glucose 25 per cent, chloral, benzyl fumarate, watermelon seed, extract of allium sativum (garlic), subtonin and anabolin, and numerous diuretics, all having been tried with varying results.

It is because of this, that so many different drugs and other therapeutic measures have been tried and recommended at different times during the past few years. We will simply attempt, in this paper to briefly discuss some of these remedies. With some we have had considerable personal experience, both in private and hospital practice; a few we have only had very little opportunity to try out thoroughly and must quote from the reports and experience of others.

Drugs

We shall, if time permits, touch on the use of ammonium chloride, calcium and potassium chloride, hepatic extract (heparmone), phenobarbital (luminal), ephedrin, alpha-lobelin, verodigen, scillaren, erythrol tetranitrate, Ringer's solution, cymarin, theobromin alkaloid, and its combinations (theocalcin, theominal, theocyl, theobryl, etc.), the double salt of sodium mercuri-o-chlorphenoyxl-acetate and diethyl-barbituric acid in a 10 per cent neutral sterile solution (novasurol), methyl-isopropyl-cyclohexenon in aqueous sodium salicylate solution (homocamfin or "hexeton"), allylisopropylbarbituric acid—phenyl—dimethyl dimethylamino-pyrazolon (allonal), theophyllin or theocin (dimethylxanthin.)

Buerger's Disease

The intravenous injections of radium chloride, typhoid vaccine, sodium citrate, and intravenous injections of hypertonic (5. per cent: 150-300 c.c.) salt solution, for the relief of pain in Buerger's disease (thromboangiitis obliterans) we need only mention.

Amputation has been the usual surgical procedure in this condition in the presence of gangrene and excessive pain. Now roentgen-ray therapy has been found to relieve the suffering of some of these patients. Electric light therapy, oven-baking, and other forms of heat and light treatment have been tried. Lumbar sympathetic ganglionectomy has relieved pain and produced an increase in the blood flow of the feet as shown by surface temperature studies and determinations of the rate of heat elimination. George E. Brown, of Rochester, Minn., believes intravenous injections of typhoid vaccine to produce systemic fever have been the most successful medical measures for alleviation of pain and increasing circulation in Buerger's disease.

During the past three years several of my cases had sympathectomy done—but without very satisfactory results. Adson has stripped the common iliac arteries and removed the second, third and fourth lumbar sympathetic ganglia—to block the vasomotor paths to the distal vessels of the feet.

Some believe baking for the improvement of circulation is dangerous, for it may predispose to secondary infection. *Ringer's solution* given by the duodenal tube in large quantities (six to twelve quarts daily) over a period of months seemed to allay the disease temporarily. Others have used large quantities of Ringer's solution by hypodermoclysis in conjunction with intravenous injections of 2 per cent sodium citrate solution, together with potassium iodide internally. Allonal, neonal, and luminal give these patients needed rest, and some relief from pain. Arterio-venous anastomosis is to be condemned. Bier's hyperemic suction has given some relief.

Conservative treatment must be carried out first in all cases—because many cases may improve, and surgical intervention thus avoided. Some of the cases, if studied more carefully, will show a wrong diagnosis was made—and in others a diagnosis made very late. The outlook for ultimate cure in these cases at present is NOT GOOD. The temporary arrest of the disease has been accomplished in many of these cases. I know of no complete permanent cures.

Angina Pectoris

Schittenhelm and Kappis in their paper review five different surgical procedures in angina pectoris, all pain abolishing. They recommend that after failure of all internal measures, either extirpation of the superior cervical ganglion or the resection of the depressor nerve is indicated.

At the Peter Bent Brigham Hospital, Boston, a number of patients have been operated on for angina pectoris with satisfactory results. Levine and Newton state some patients have been strikingly relieved by cervical sympathectomy. Finally, Kerr (*Annals Clin. Med.* 4:30, 1926) reports that in two cases complete relief and partial relief in one case followed resection of the left superior cervical ganglion, together with the superior cardiac

nerve. Levine and Newton removed all three cervical sympathetic ganglia and the cardiac nerve on the left in a girl twelve years old, with blood pressure 172/74. Swetlow and Schwartz have relieved five patients of severe *cardiac pain* by *paravertebral alcohol* injections.

I have found the use of theominal (theobromin grains V and luminal grain ½) and erythrol tetranitrate (½—1 grain in tablets) to relieve anginal pains. (Benzyl fumarate (5 grains, may be tried).

It appears that theobromin acts as a vasodilator and the luminal quiets the patient and has a tendency to lower blood pressure.

It has been demonstrated by Gruber, Shackelford and Eckfund (*Arch. Int. Med.*, Sept. 15, 1925) that luminal will lower blood pressure in cases of arterial hypertension. Wiechmann believes luminal has an antispasmodic action upon the blood vessels.

Wearn (*Med. Clinics* of North America, March, 1925) states that one of the striking effects of theobromin is dilatation of the coronary arteries. Some believe theobromin lowers blood pressure by splanchnic dilatation.

Erythrol tetranitrate effect is more enduring than other nitrites and there does not appear to be a tendency to the establishment of a tolerance. Tablets of erythrol tetranitrate retain their full activity for a long time.

Strauss emphasized the value of small doses of luminal with diuretin (Theobromin sodium salicylate). Diuretin, even in large doses, has not given me very good results. Theocalcin (calcium theobromine salicylate in 7½ grain tablets) may be used instead of diuretin. Theocyl (acetylsalicylyl theobromine 7½ grain tablets) may also be substituted. Theocyl particularly exerts a favorable effect in cases associated with nephritis with edema and ascites. Theocyl appears to lower the blood pressure promptly, thereby lessening the tension of the vascular system and thus affording relief of the subjective symptoms. The pulse is improved (even with digitalis) as the result, probably, of the widening of the coronary vessels and the better perfusion of the heart with blood. The same may be said for theobryl, a Swiss preparation. These remedies, such as just mentioned, also theocin or theophyllin, theocin-sodium acetate should not be taken on an empty stomach. Theocin, at times, causes nausea, vomiting, headache, and epigastric burning and therefore can only be given in small doses of three to five grains, four times a day, for several days—then it must be stopped for an interval of a few days. Theophyllin is the natural alkaloid discovered by Kossel in 1888, in tea leaves and possesses marked diuretic properties. Theocin is a synthetic reproduction of this alkaloid. These remedies are chiefly used for the removal of dropsy in cases of cardiac and cardio-renal disease.

It is assumed that in all the conditions discussed in this paper that the patient is examined thoroughly for *foci of infection*, abnormal blood chemistry, and other existing pathological factors are corrected and, if possible, removed. *Dietary measures*—particularly restriction in *salt* and *protein* in renal and hypertensive cases are highly important.

Syphilis, diseased teeth, tonsils and sinuses, gall-bladder disease, gastro-intestinal and nervous disorders, must, of course, all receive proper attention.

Hypertension

Removal of foci of infection, treatment of existing lues, kidney disease and vascular sclerosis; endocrine therapy (particularly in women at the climacteric age), hydrotherapy, physical and mental rest, radium emanation, venesection, high frequency, the nitrites, veratrum viride, aconite, iodides, saiodin, neoarsphenamin, have all been tried—and in many instances with benefit.

Recently, however, several newer forms of treatment have been studied.

The use of hepatic extract (heparmone), calcium and potassium chloride, luminal, parathyroid, animasa, etc., have recently been recommended.

Wallace and Ringer (*J. A. M. A.*, 53:1629, Nov. 13, 1909) in a comparative study of the actions of the nitrites usually prescribed in hypertension, show that erythrol tetranitrate gave more lasting effect than the others. This was done on normal individuals, and on patients having arteriosclerosis. They remark "It is certain that arteriosclerosis of a high degree does NOT prevent the nitrite group from exercising its usual action, and, in fact it seems conceivable that only in cases in which the splanchnic vessels are no longer capable of dilatation will a fall in blood pressure NOT OCCUR."

I have used erythrol tetrantrate (tablet, each one half grain) with good effect, in conjunction with theominal. At times I use allonal (2⅔=5⅓ grains) with happy results. *This relieves the* ***headache promptly,*** particularly when one-half grain tablet of erythrol tetranitrate is occasionally also given.

Many of these cardio-vascular hypertensive cases have frequent attacks of headache, dizziness, and peculiar psychotic episodes. In these patients the use of luminal, neonal, peralga, or allonal is certainly of great benefit (even when bromides are not given).

Major and Stephenson (*John Hopkins Hospital Bull.* 35-196) found that calcium chloride alone or combined with potassium chloride abolished the rise in blood pressure produced by guanidine and methyl guanidine.

Some of the results obtained by the use of calcium chloride therapy in arterial hypertension were reported in 1914. Further clinical work has been done at the Toronto General Hospital by Addison and Clark. Patients were given from 90 to 180 grains of calcium chloride a day. All cases studied by these men had an initial systolic pressure of 170 mm. of mercury or over. Some ranged as high as 262. The diastolic pressures ranged from 84 to 152 and the ages were from 28 to 91. Only those cases were considered as reacting in which the salt reduced the systolic pressure 30 mm. or more and maintained it there, and kept the diastolic pressure 12 mm. or more lower than the initial reading. Of the forty-five cases studied by Addison and Clark, 26 or 57.7 per cent reacted with calcium chloride and 6 or 13 per cent with potassium chloride, making a total of 70 per cent. The objectional feature to the giving of calcium chloride is the gastro-intestinal upset. The calcium chloride produces an inorganic acidosis which must be watched. The use of milk or buttermilk will considerably relieve the gastro-intestinal distress. They conclude that—

1. Calcium and potassium chlorides will produce a decided fall in blood pressure in a larger percentage of cases of hypertension with a coincident improvement of the patient's symptoms.

2. Edema will improve and disappear under their action.

3. The treatment must be persisted in for three or four weeks to get results.

4. The only serious objection is the possibility of producing symptoms of an inorganic acidosis.

I have used calcium chloride intravenously in a 10 per cent sterile solution with some improvement in a few cases. In cases with marked edema and ascites, the use of calcium chloride did not appear to help very much.

Hepatic Extract

Before the section of Pharmacology and Therapeutics of the A. M. A., in April, 1926, Ralph H. Major, of Kansas City, reported again that methyl guanidine, a normal constituent of the urine, was capable of producing a marked and prolonged elevation in blood pressure in animals and in man.

Major found that certain liver extracts were very potent in both producing and preventing such an experimental hypertension. The liver extract with which Major was working was obtained by a process of alcoholic fractionation and has a nitrogen content of .001 per cent. The presence of histamine, choline, and peptone was excluded with a reasonable degree of certainty.

The liver extract produced no sharp fall in blood pressure, such as these three substances produce, has little effect on normal blood pressure and is not toxic in very large doses. No symptoms of anaphylactic shock are encountered according to Major. They have treated approximately 100 patients suffering from high blood pressure with this histamine and choline free preparation.

The results were not good in patients who have suffered from arterial hypertension for a long time and whose range of pressure over a period of years was known—as a rule, in such cases there was little evidence of specific effect. The most striking results were obtained in patients whose hypertension was apparently of brief duration and in whom anatomical alterations have not yet taken place.

It is claimed by Major and others that improvement in symptoms has been a very striking feature in many patients even though the blood pressure was *not* lowered. The evidence in favor of hepatic extract at present, is far from conclusive.

Dr. Orlando H. Petty informs me that the results obtained from the use of hepatic extract have been uncertain and unsatisfactory. He studied its effects on cases at the Philadelphia General Hospital and the Polyclinic Hospital, Philadelphia.

Major standardized the liver extract against guanidine and had taken as a temporary unit the amount of depressor substance necessary to neutralize 0.1 mg. of guanidine in an animal weighing 2.5 kilograms.

It appears that for clinical use in the treatment of hypertension, hepatic extract is not yet to be considered a satisfactory therapeutic agent. Much more study and experimentation must be carried on before the general profession accepts it.

James and Laughton (*Canad. Med. Assoc. Jour.*, 15: 701-702, July, 1925. MacDonald and Burnett (*Boston Medical & Surg. Jour.*, 194: 38-388, March 4, 1926) and Major (*Jour. A. M. A.*, 85: 252, July 25, 1925). have done considerable work with hepatic extract. Some of Major's patients received hepatic extract every day and some twice daily, and some only once a week. The extract was administered intravenously, intramuscularly and subcutaneously. The effect is more prompt after intravenous injection, but is also obtained after intramuscular and subcutaneous injections. Within an hour after injection, the blood pressure usually falls, from 20 to 50 mm. of mercury. This fall is usually gradual and not accompanied by any symptoms, although occasionally some dizziness may occur. The fall usually lasts only a few hours or possibly for a day. Major has obtained, in some patients, a fall in blood pressure which persisted for one week or more, after *receiving* eight or ten doses of the extract—particularly in comparatively young persons, without evidence of renal damage or arteriosclerosis.

In a letter to me dated April 3, 1926, Eli Lilly and Company, through their Research Laboratories, state that liver extract (heparmone) for the treatment of essential or idiopathic hypertension at the present time is purely an experimental product. They have not yet released this to the medical profession at large and do not intend to until they are more certain as to the status of the product in the treatment of hypertension. They say "We must know more about dosage, frequency of dosage, and type of case best suited for treatment before we make general distribution of this product."

Novasurol

In the Spring and Summer of 1924, I began the use of novasurol. Novasurol is a complex synthetic mercurial preparation, being a double salt of sodium mercurichlorphenoxyl-acetate and diethylbarbituric acid. It contains 33.9 per cent of mercury, and is employed only in a 10 per cent neutral sterile solution. It may be administered intramuscularly or intravenously. Sometimes the intramuscular injection is painful and Marvin, of Yale, has reported abscesses, following necrosis of tissue, occurring some days after intramuscular injections. This distressing complication can be avoided by intravenous injection. However, sometimes this gives rise to a too rapid absorption of the mercury and resulting stomatitis and colitis.

After the introduction of this drug, as an antisyphilitic remedy in Germany, by Heilig (1920), Poelchen and Saxl found that the injection of this soluble mercurial compound in cases of decompensated syphilitic aortic lesions was followed by a rapid and marked increase of urine. It was then demonstrated that it is a very powerful diuretic and produced profuse diuresis even in cases in which digitalis, strophanthus and the purine derivatives had failed.

It's diuretic effect is probably due to a direct action upon the tissues, an abstraction of water and sodium chloride from their colloidal combination.

Nonnenbruch, Saxl, Heilig, Brunn, Kulcke, Bohn, Eppinger, Hegler Blum, Schmidt and others have experimented considerably with this drug. Marvin finds that novasurol usually increases excretion of chlorides and water—that diuresis begins within two to four hours reaching its maximum diuretic effect at the end of eight hours and that this may continue for twenty-four hours. It appears to have no effect on inflammatory exudates.

I have seen severe stomatitis occur in an adult, male, ward patient (with bad mouth infection), after one-half ampule—and severe diarrhea (colitis) and stomatitis in another, female, ward patient, after one ampule. In both of these cases, however, marked diuresis occurred, and the ascites and general subcutaneous edema in the case of the woman diminished rapidly.

In none of our cases have we had serious complications, collapse, abscesses, or other very prolonged distressing symptoms. It is better to start with a smaller dose—say one-half ampule, and then twenty-four or forty-eight hours later, if no symptoms of mercurialism appear, a whole ampule may be given. The next dose should not, as a rule, be given until after an interval of three days, unless the edema be extreme and diuresis not very marked.

After using this mercurial preparation for two years, I can state that it is a most active diuretic, particularly useful in dropsical conditions following heart failure (in adults) in cases of arteriosclerosis, coronary disease (with or without angina), hypertension and syphilis. I have never seen any serious damage to the kidneys follow its use—even in cases with a long standing mild grade of nephritis. It should not be used in chronic cases having acute exacerbations, or in cases of acute nephritis, or, in the presence of serious chronic kidney disease with marked organic changes in the glomeruli

and tubules. Marked albuminuria (low specific gravity), many granular casts and many red bloodcells, if present in the urine, are positive contraindications to its use.

The administration of 20 or 30 grains of calcium chloride or of ammonium chloride three or four times a day greatly increased the diuretic effect of the novasurol in many of the cases.

Keith, Barrier and Whelan (*J. A. M. A.*, Sept. 12, 1925), used this joint ammonium chloride and novasurol treatment in eleven of the twelve cases of nephritis with edema studied by them. The ages of the patients varied from nine to sixty-nine years. Symptoms of acidosis (because of the ammonium chloride) occurred in only a single instance. In most of their cases the immediate results were very satisfactory.

Crawford, Hamilton, and McIntosh noted decided improvement in the clinical condition of eight patients suffering from severe heart failure and who were not helped by digitalis, theocin, and diuretin. In these cases diuresis began in the first three hours, reached its height in six to nine hours, and terminated in twenty-four hours. They found no evidence of any damage to the kidneys.

Gamble, Blackfan and Hamilton attribute the diuretic action of ammonium sulphate, ammonium chloride and calcium chloride to the increased acidity of the bodily fluids demonstrable in the blood plasma and an increased excretion of the fixed base in the urine.

Animasa

H. Griesbach (Giessen: Alfred Topelmann, 1923) attempts to demonstrate the value of animasa, a proprietary extract prepared from blood vessels, in the treatment of hypertension. A brief discussion of the etiology of hypertension is followed by experiments showing the depressor action of animasa on normal animals and men. Then follow protocols of patients with hypertension treated with the drug. Although some falls in pressure are recorded, the results are not convincing, for no allowance is made for the spontaneous variation in blood pressure, and no diastolic pressures are recorded. Further evidence is needed to demonstrate the usefulness of this preparation in the treatment of hypertension.

Parathyroid

With regard to the use of parathyroid hormone in hypertension, I may quote from an editorial in the *J. A. M. A.* (85:441, 1925), in which it is stated: "In uniformity with what has been observed for other tissue extracts, the purified extracts of the parathyroid cause a slight fall in blood pressure after intravenous injections. Subcutaneous administration, unless massive doses are used, has little or no immediate effect on blood pressure. Hypercalcemia can be induced by the use of the parathyroid hormone even in a fully anesthetized animal. There appears, under any condition, to be a definite limit to the degree of calcium mobilization possible in the blood, the highest concentration (in the dog) being about 20 mg. per hundred cubic centimeters of blood. The blood phosphorus shows very little fluctuation during the period of calcium increase; but when a marked hypercalcemia is developed the phosphorus may increase progressively. It is thus obvious that an agency of marked and decidedly unique potency has been placed in the hands of the investigator. What the clinician may do with it remains to be seen."

Heart Failure

We have all met with cases of heart failure in which the use of the various active preparations of digitalis—such as, digalen, digitan, digifoline, digifortis; strophantin, ouabain, used by mouth or by injection have failed to give satisfactory results for some reason or another, particularly when associated with loss of kidney integrity and the presence of edema and ascites. In some of these cases the blood shows a strongly positive Wassermann reaction. The patients complain of air hunger, extreme shortness of breath, cyanosis, cough, restlessness and insomnia and at times considerable precordial distress. The body is water-logged. These patients become extremely bad during the night, frequently pulmonary edema sets in and on visiting the patient find them gasping for breath, with what at first resembles a severe attack of bronchial asthma—really, a cardio-renal "asthma."

What Shall We Do for These Patients?

We see them only too frequently in the wards of our hospitals. Very many are the cases of this type that I have had occasion to treat in hospital and in private practice during the past seventeen years. Often, it seems, relief has been promptly obtained by the administration of oxygen on the so-called installment plan, allowing the patient to inhale the oxygen for a few minutes every hour until definite relief is obtained. Venesection, of course, is often indicated. The use of homocamfin (cyclosal or hexeton) in 2.2 c. c. ampules (10 per cent solution) for intramuscular injection, and 1.2 c. c. ampules (1 per cent solution), for intravenous use, has, in my hands, given favorable results, particularly, when used in conjunction with very small subcutanetous or preferably intramuscular injections of adrenalin chloride (epinephrin) 1:1000 solution. Haeberlin recommends subcutaneous injections every hour or two—0.1 to 0.2 c. c. of 1:000 solution of adrenalin chloride massaged into the tissues—in grave "toxic weakness of the circulation."

It is very important, of course, to give the patient rest and an opiate is often indispensable, atropine in large doses often necessary. One or two tablets of allonal or one grain of luminal, as indicated, often gives the patient several hours of sound sleep—without depressing the heart. As diuretics and cardiac stimulants, I have used theocalcein (theobromine-calcium salicylate) in 7½ grain doses and theominal. At times small doses of pituitrin are used in conjunction with the small doses of adrenalin to relieve the attacks. Nitroglycerine, 1/100 grain, under the tongue, acts rapidly.

Pratt (J. A. M. A. Sept. 11, 1926, Vol. 87, No. 11, p. 809) discusses cardiac asthma (four groups), and recommends the use of subcutaneous injection of morphine, bandaging the limbs, bleeding (high blood pressure), caffeine sodiobenzoate, epinephrine and amyl nitrite.

With ephedrin I have had no experience. Ephedrin, it seems, has general physiologic effects in man similar to those produced by epinephrin. It has, however, distinct practical advantages over epinephrin because of its more prolonged action and the fact that it can be administered effectively by mouth in doses of 50 to 125 mg. It stimulates the heart action and has a tendency to increase the output of urine. T. Grier Miller, of Philadelphia, has reported on its use and believes that the widest range of usefulness of ephedrin will be found in the treatment of asthma and of acute circulatory depression.

Ephedrin is the name given to an active principle isolated by Nagai from an Asiatic drug, Ma Huang (ephedra vulgaris var. Helvetica), which has been used in the practice of medicine in China for more than five thousand years.

Chen and Schmidt (J. A. M. A. Sept. 11, 1926, 87, No. 11, p. 836) state that ephedrine as a circulatory stimulant is rather a disappointment, and in chronic hypotension and acute circulatory crises is of *little or no value*.

I have not had any experience with the use of alpha-

lobelin (given intramuscularly or subcutaneously 3/20 grain or 1-20 grain intravenously. It is primarily used in collapse, shock and respiratory failure. It is sold in ampules of the proper dosage.

Verodigen, which is the gitalin constituent of digitalis leaves, first obtained by Kraft. It slows the pulse, increases the pulse volume, raises blood pressure and promotes diuresis. When given by mouth it is more rapidly absorbed and its action more promptly developed than with other digitalis constituents. The results of the oral administration of verodigen are often almost as rapid as are those following the intravenous use of such remedies as strophanthin. According to Straub (*Deut. med. Woch.* 1919, No. 11) the outstanding advantages of this preparation are its very rapid absorption, its prompt and uniform action, and its good keeping qualities. There is less danger of cumulative effects than with other digitalis preparations. Straub and Krehl report that in cases of cardiac insufficiency with retarded circulation, stasis and dropsy, they usually administer 1-160 to 1-80 grain, two or three times daily for the first day or two. Thereafter, based upon the reduction of the ventricular beats, the dosage is maintained at the lowest possible size (1/160 grain twice daily). Verodigen is supplied in tablets containing 1/80 grain.

I have not used scillaren, cymarin or cardiazol to any extent and therefore cannot report as to their value in cardiac disease. Scillaren, the active principle of squill, was first prepared by Stoll and Sutter in 1921 and represents the total cardio-active glucoside of urginia scilla. It is a chemically pure substance. It is indicated where digitalis or strophanthin fails, acts insufficiently or ceases to be effective because of tolerance due to protracted use. The dose is one tablet, 1/128 grain or 1 c.c. of the solution orally three to four times daily. Intravenously, a total of 1 c.c. per day.

Cymarin is the active principle of apocynum cannabinum in a chemically pure form. It is a cardiac tonic and diuretic. It is preferably given intravenously in dose of 1/180 to 1/60 grain. The dose by mouth is 1/200 grain gradually increased, if well tolerated by the gastro-intestinal tract, to 1/50 grain. It is made up in ampules 1/60 grain and in tablets 1/200 grain.

Cardiazol (pentamethylentetrazol) is reported to be superior to camphor and digitalis in its effect on paralysis or inhibitions of the heart, and therefore supposedly of value to preserve life in collapse and actue circulatory disorders. The dose is 1½ grains (in 1 c.c. ampule or in 1½ grain tablet)—3 or 4 times a day.

Ringer's Solution, it seems to me, should be used more often by hypodermoclysis, in cases of cardiac collapse. I shall quote from an editorial recently appearing in MEDICAL TIMES, May, 1926, page 125, LIV, No. 3.

Ringer's Solution: An isolated heart when supplied with oxygen will continue to beat spontaneously for a much longer time in Ringer's solution, which closely resembles the blood serum in constitution, than it will in physiological salt solution. This is a laboratory axiom.

Ringer's solution is a physiologic solution used for perfusing the heart of the frog. It contains sodium chlorid, 0.650; potassium chlorid, 0.014; calcium chlorid, 0.012; sodium bicarbonate, 0.020; monosodium phosphate, 0.001 (glucose, 0.200); and water to 100. Another formula is: sodium chlorid, 1.8; calcium chlorid, 0.048; potassium chlorid, 0.084; sodium bicarbonate, 0.06; distilled water, 200. Still another is: sodium chlorid, 229 gr.; magnesium chlorid, 25¾ gr.; potassium chlorid, 8¾ gr.; magnesium sulphate, 13 gr.; calcium sulphate, 8¾ gr.; distilled water, 1 pint.

Pearce and Macleod, in their "Fundamentals of Human Physiology," summarize a very interesting theory concerning the cause of the heart beat.

"It will be remembered that the blood contains salts of sodium, potassium and calcium in solution. If these salts are replaced by other nonpoisonous salts in the same concentration as the salts removed, the heart will not beat. If the heart is perfused with a solution of sodium chlorid alone, the beat becomes very weak and finally stops. If, however, a small amount of calcium and potassium salts be added to the sodium chlorid solution, the heart will again begin to beat, but it stops after a while in a state of relaxation, or diastole, if calcium chlorid in excess be added to the solution, or in systole, or contraction, if an excess of potassium salts be added. These experiments suggest that the salts of the blood offer a solution to the problem of the cause of the heart beat, the potassium favoring relaxation, and the calcium contraction. If the proper balance of these salts is present in the blood, it is conceivable that a regular sequence of contraction and relaxation of cardiac muscle will take place because of the action of the salts."

Here, it seems to us, is a key to a new therapy in the presence of heart failure. Why should we not avail ourselves of this physiologic means of restoring tone and vigor to an exhausted organ instead of depending almost wholly upon toxic agents, in other words, drugs?

Ringer's solution by hypodermoclysis would undoubtedly fulfil the clinical indications in cardiac decomposition and other exhaustion states with a reasonable approach to adequacy. Indeed, in the light of laboratory truths it would be stupid not to employ this resource.

It is all very well to insist that a well-balanced diet supplies a sufficiency of inorganic mineral salts of the character under discussion. How many American diets are well-balanced? How many adults drink milk and make a point of eating green vegetables? These cardiac cases frequently reach us in bad shape after years of calcium starvation. Their hearts need calcium as a rickety baby needs cod liver oil, and then, forsooth, we solemnly proceed to digitalize them.

The good record of Ringer's solution in the treatment of shock and hemorrhage has presumably been due in very large part to its effect on the heart.

A fair trial still awaits Ringer's solution in cardiac cases.

Barium chloride was used by Cohn and Levine with prompt relief in three cases of complete heart block with frequent attacks of syncope and convulsions not helped by usual procedures, including adrenalin. Barium chloride was given by mouth 30 mg. three times a day. The barium increased the irritability of the ventricles.

Summary and Conclusions

1. Attempt was made in this paper to mention and emphasize some drugs that may be of use in cardivas-cardio-vascular-renal disease, cularrenal disease.

2. From a thorough study of the literature, it would appear that while *operative* procedures for the relief of angina pectoris and thrombo-angitis obliterans have at times given apparently satisfactory results, these measures better be resorted to very hesitatingly and only after all other conservative medical means have failed. Sir James Mackenzie questioned the advisability of removing a danger signal whose absence may result direly. *Pain* notifies the patient when the heart is being overworked and forces the victim to stop all exertion, thus acting as a protective measure. Mackenzie states that angina is still a matter for vague speculation and that

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Periodic Urological Examinations in Persons over Forty for Malignancy

GEZA GREENBERG, M.D.
New York

The last two decades have been epoch making in the history of the human race. The arts and sciences have progressed by leaps and bounds. New inventions, while by promoting the industrial and economic state of the race have thus added to their happiness, have likewise increased their hazards. Medicine and surgery have not only kept pace with them, but have actually outdistanced them.

The late war with its many implements of death designed for the destruction of life has taught us the secrets of conservation of life. It has taught us the successful treatment of infections and wounds, and has thrown a good deal of light on kidney pathology and other internal diseases. The development of biochemistry has added greatly to the successful treatment of disease. As a result of progressive evolution in the physiological and pathological laboratories, it is possible to institute treatment in the early stages of disease when it is most effectual.

Likewise have laboratories of physics and mechanics been of great help for the construction and improvement of such implements and instruments as to render an early diagnosis and treatment possible.

This has been, particularly, evident in the early recognition and treatment of various infections, metabolic, renal and neoplatic diseases. And, whereas either complete or incomplete recovery from other than neoplastic diseases even if recognized at a more or less advanced stage is possible, that of malignancy, if not impossible, is certainly not the rule, but rather the exception.

It is self evident, therefore, that in order to cure a disease, especially a malignant one, an early diagnosis is essential, while it is strictly localized and free from metastases. This in turn is possible only by an early and painstaking examination. While this is not feasible in all the regions of the body, as in some of the inaccessible organs of the human organism, and in which no pathology is suspected without subjective symptoms, in the urogenital tract, on the contrary, it is susceptible of and amenable to an early diagnosis either with or without subjective symptomatology. This is, particularly, true of tumors in the bladder which may be present for months or years without symptoms, until the appearance of blood. Then again hematuria may be evanscent or intermittent in character, and, if not accompanied with other symptoms, may lull the patient into a state of false sense of security.

Again one may have a train of symptoms due to another cause, but associated with a tumor in the bladder, the latter not being suspected until discovered accidentally in the course of a routine examination, as the following case indicates.

A. P. K., age 34, had a typical attack of renal colic. Upon cystoscopic examination a small pedunculated papillomatous tumor, the size of a s split pea, has been seen springing from the region of the right ureter, about 2 cm. posterior to it. It was immediately destroyed. The colic was caused by a stone in the ureter, which passed subsequent to ureteral dilatation. Had he not been seized with ureteral colic, then the tumor formation could have gone on unhampered and unrecognized until the appearance of special symptoms. It turned out to be a fortunate coincidence to the patient, for on re-examination about six months later, no trace of recurrence of the neoplasm was noted.

It is not unusual in patients with bladder tumors, to elicit a history of recurrent attacks of hematuria for one or two years, and not until the bleeding assumes alarming proportions do they seek medical counsel. The following history is a typical example of many such instances.

C. K., 44; weight 230 pounds, seen April 23, 1923. Father died of carcinoma. Patient noted for a period of six months intermittent attacks of hematuria, and only after severe bleeding did he consult a physician. On cystoscopic examination a very large papilloma was seen on the left lateral wall of the bladder. It was a massive sessile growth, about the size of a walnut. The free vesical surface was distinctly villous, but the base looked rather suspicious with some edema of the vesical mucosa. It was ulcerated in places and covered with clots. In view of the rather poor family history I suggested an open operation to which he most vehemently objected. I was constrained, therefore, to adopt a less radical measure, namely, that of electrocoagulation.

At first it responded very slowly to the usual D'Arsenval current and not until the Oudin current was resorted to did it show any encouraging results. Paradoxical as it may seem, this has been my usual experience with two currents derived from the standard high frequency machines. For a considerable space of time I have derived the bipolar current from a specially constructed machine, known as the "Thermoflux" with a great deal of satisfaction, but owing to the necessity of frequent adjustments during its operation, I had to abandon it.

I have merely selected these two cases to illustrate and stress the importance of an early examination, even if there is but the least suggestion of an urlogical lesion. A not very uncommon way of scenting trouble is by life insurance examinations, in the course of which abnormal constituents are detected in the urine.

What are the usual patholigcal findings in the urine that warrant a careful investigation of the genito-urinary tract? I am omitting from consideration all other lesions except tumors of the urinary tract. The answer is—blood, when present in the urine in any amount, is indicative of a grave lesion, and requires a most thorough study. Blood is never a normal constituent of urine (excluding, of course, that following rough instrumentation) whether macro- or microscopic in quantity. Its presence, especially when dissociated from pain and other symptoms, is doubly suggestive of a grave lesion, which is usually a tumor in the bladder or the kidneys.

The location of the tumor within the bladder determines largely the presence or absence of pain and other urgent symptoms. Tumors in the trigone or in its vicinity and in close proximity with the sphincter occasion pain, whereas, if farther removed from these regions, are relatively painless. Malignant tumors are usually associated with cystitis, while benign papillomata are

often free from it until an advanced stage. However, all tumors in the bladder must be considered potentially malignant and dealt with accordingly.

The span of life, as indicated by recent statistics of life insurance companies, has been considerably extended in the last two decades. This has been rendered possible by preventive medicine; and it is not unreasonable to assume that, in the not distant future, life will take on an added extension of lease, away beyond the proverbial span of three score and ten.

Since the incipient stage of tumors of the urinary tract can be easily detected, it behooves, therefore, to subject persons of the fourth and fifth decades of life, particularly, those with a malignant family history, to a methodical examination at yearly or two-yearly intervals. Were this possible with all the other organs in the body, then it would be reasonable to predict an early eradication of malignant disease from the human race, and make it as scarce as smallpox, or other controllable infectious diseases.

The first requisite is a complete chemical and most painstaking microscopic urinary examination at six months intervals from the age of forty years onwards. This is to be followed, whether the findings are positive or negative, by a digital examination of the prostate and the seminal vesicles. This, in turn, is followed by a thorough cystoscopic examination without catheterization of the ureters, unless there is a special indication for it. This can be performed very gently without inflicting the least particle of pain. If the findings are negative no harm is done, and the urine can be examined at six months intervals and a cystoscopy repeated once in two or three years.

If, on the other hand, blood is present in the urine, then no stone must be left unturned to determine its origin. If under such conditions the endovesical exploration proves negative, then it becomes incumbent to catheterize the ureters to determine the source of the blood, and, if need be, to invoke the aid of x-rays for pyelographic studies. Otherwise the golden opportunity of curing the patient may forever be lost—an opportunity which rarely, if ever, knocks twice at any one's door.

In conclusion, let me add that, any subjective urinary symptoms arising in a person of forty or over are a sufficient warrant for a most thorough examination; and any physician who neglects to examine his patient carefully and to give him the benefit of the most modern diagnostic facilities, is remiss in his duty and is most atrociously violating his Hippocratic oath, for no matter how trifling the symptoms are at the beginning, they may lead to most stormy and grievous consequences in the future.

120 East 34th Street.

The Glands of Internal Secretion

(Concluded from page 245)

Hunt, H. Lyons ("New Theory of the Function of the Prostate Deduced from Gland Transplantation in Physicians," Endocrinology, Vol. IX, No. 6, pages 479-489, 1925).
Hunt, H. Lyons ("Experiences in Testicle Transplantation," Endocrinology, Sept., 1922, Vol. VI, pages 652-656).
Hunt, H. Lyons ("Gland Transplantation," Amer. Jour. of Clin. Med., Vol. 30, No. 12, pages 862-866).
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Blood Uric Acid

(Concluded from page 247)

Caution has been observed and no differentiation made between precordial stress, angina pectoris, coronary thrombosis, and other conditions presenting cardiac symptoms, of like nature.

Conclusions

1. Observation of a series of cases presenting the symptom of stress over the precordium presents a blood uric acid, the mean average of which is 1.67 milligrams higher than a series of cases in which precordial stress symptoms are absent.

2. No interpretation is here vouchsafed in reference to the meaning of the above findings.

3. Further research work for confirmation of the above may be stimulated with the result that an interpretation shedding further light upon angina pectoris, and other allied disorders, may be evolved.

148 West Seventy-fourth Street.

What Legal Remedy Has a Consumer?

(Concluded from page 250)

One, however, remains within the abdomen, and the surgeon is sued on the grounds of negligence. If he examined the wound for missing pads after every laparotomy he would kill 50 per cent of his patients, they would succumb to fatal peritonitis. I call this leaving a pad within the abdomen an unavoidable accident, and yet every surgeon is convicted when such a thing occurs.

Walter Jeffreys Carlin, Esq.: The decision in this hotel case was on the theory that the innkeeper is an insurer. He is required to use care in keeping out of the food he serves any substance that ordinarily should not get in it. We have many of these cases every year. I have had some experience with them myself. If we adopt the theory that all a man has to do to recover damages is to say he was injured we will have a serious condition of affairs in placing such a burden on the manufacturer. Mr. Bard spoke about shifting the burden of proof, but there must be some limit. The manufacturer takes every possible precaution, such as in a recent case a milk company had a most modern plant and yet some phosphorus was found in a bottle of milk and the company was held liable. How the phosphorus got into that one bottle of milk nobody knows. The jury believed the chemist who said it was there. You have a serious situation when you hold the manufacturer in such a case. At the same time we must not prohibit a man with a real cause of action from recovering.

Newer Therapy of Cardio-Vascular-Renal Disease

(Concluded from page 255)

drastic operative measures for such a little known condition does not redound to the credit of medicine.

3. The use of novasurol in cases of marked edema and ascites (arteriosclerotic and hypertensive, congestive heart failure) of cardiac and cardio-renal origin has given favorable results in a considerable number of cases, making tapping of the abdomen unnecessary. The synthetic complex mercurial compound salyrgan seems to have similar effect on edema and ascites.

4. It appears that novasurol gives better results when ammonium chloride or calcium chloride is administered at the same time. Novasurol is more particularly useful in cases of *latent tertiary lues* with *cardiac insufficency* than theocin or theobromin.

5. The further use in cardiac and cardio-renal conditions of such remedies as homocamfin or cyclosal (methyl-isopropyl-cyclohexenon in aqueous sodium salicylate solution), theocalcin, allyltheobromin (theobryl), theominal, theocin, theobromin alkaloid, allonal (allyl-isopropyl-barbituric acid, phenyl-dimethyl dimethylamino-pyrazolon), luminal, scillaren and verodigen should be continued and encouraged.

6. Finally, it must be remembered that it is manifestly impossible by any means of treatment to remove organic changes occurring in cardiovascular-renal disease. Therefore, avoid the use of too many remedies. Avoid meddlesome therapeutics and a multiplicity of drugs.

One must agree with Sir James Mackenzie when he says that "To the earnest student of medicine the contemplation of the present-day knowledge of therapeutics cannot but bring a sense of humiliation. Notwithstanding the advances that have been made in all depart-

ments of medicine, therapeutics is still mainly empiric, and there seems little prospect at present of it being otherwise. The reason for this state of things is not due to any individual but merely to the fact that medicine has not advanced far enough to know what steps to take to render therapeutics rational." One must understand the nature of the condition to be treated and to know whether the remedial agents employed in treatment are capable of modifying the existing pathological state.

In speaking of angina pectoris, Mackenzie very eloquently says that "If these people who profess to be able to remove changes that induce angina pectoris will realize that they are of the same nature as the attenuation of the skin in old age, the tortuous and thickened radial arteries and the arcus senilis, and even the gray hairs, and if their remedies will restore the skin to the condition of youth, straighten the tortuous arteries and soften the hardened vessel, and dispel the arcus senilis, then they may claim to remove the condition that produces angina pectoris."

7. It appears that the most active diuretic drugs in cardiac failure (of the arterio-sclerotic hypertensive or non-hypertensive types of congestive heart disease), are:

(a) Novasurol with ammonium chloride.

(b) Theocin (theophyllin) or soluble theocin-sodium-acetate.

(c) Theobromin and its salts and combinations—theobryl, theocyl, theocalcin, etc.

These remedies do not seem to act so well in general anasarca of rheumatic and syphilitic heart disease, as in dropsical conditions due to heart failure associated with arteriosclerosis with or without high blood pressure (degenerative types of cardio-vascular disease). We have, however, seen almost remarkable improvement, with rapid loss of weight in edematous patients with decompensated mitral and aortic disease—following the use of these remedies, after digitalis therapy and rest in bed had completely failed.

1425 Broadway, Camden, N. J.

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Diagnosis and Treatment

Diabetic Coma Without Acetonuria

T. H. Oliver, of Manchester Royal Infirmary, says the following case of diabetic coma possesses some unusual features: A youth, aged 21, who had been on insulin treatment since May, 1923, and whose symptoms were so severe as to necessitate three injections of 15 units daily in order to keep the blood-sugar approximately normal and the urine free from sugar and acetone, developed a severe gastro-enteritis on Oct. 1st, 1925. As a result of this he was unable to take food and, owing to a misunderstanding, insulin was also withheld. On Oct. 4th he had very severe abdominal pain which suggested to his medical attendant the onset of peritonitis. He was sent from the country to Manchester, a distance of 80 miles, where I examined him about 5 o'clock the same evening. During the journey he became unconscious, and when I haw him he was in typical diabetic coma with a feeble pulse of 128 and a temperature of 98 deg. Fahr. The heart sounds were very feeble, and he appeared to be dying. A specimen of urine was loaded with sugar, but no acetone bodies were present. There was also a faint cloud of albumin. Forty units of insulin were given immediately, and afterwards 20 units every three hours throughout the night. Lemonade containing glucose was given in unlimited amount. By next morning the patient had partially recovered consciousness but the pulse was still 120 and very feeble. During that day 80 oz. of urine were passed, sugar being present in all specimens, but no acetone bodies. From that time 20 units of insulin four-hourly were given, this being reduced gradually to 15 units t.i.d. as the patient improved. The trace of albumin persisted for three or four days and then disappeared. At the end of four days the glucose lemonade was discontinued and a solid diet gradually substituted. Except for one day, throughout the illness there were no acetone bodies present in the urine and, on that one occasion, only the slightest trace could be detected by ferric chloride solution.

The patient made an uninterrupted recovery, and when seen recently had resumed the diet of approximately 2100 calories and had returned to the dose of insulin which he was taking

before his illness. The urine was sugar-free and the fasting blood-sugar was 0.19 per cent.

The features of interest in this case are: (1) The onset of coma heralded by acute abdominal pain simulating peritonitis. (2) The treatment with large doses of insulin, together with an unlimited supply of glucose solution. This prevented the onset of hypoglycæmia, and probably with the aid of insulin was helpful in repleting the glycogen stores and thus preventing complete cardiac muscle failure. As the sugar-tolerance after the illness was the same as before, the large amount of sugar given did not appear to have done any damage to the pancreas. (3) The almost entire absence of acetone bodies is an unusual feature in a case of coma. Such cases have been recorded, but this absence has been attributed to renal failure. In this case, however, not only was there no inability to excrete sugar-containing urine in large quantities during the first week, but even when recovery had occurred and the kidney function was then presumably normal there was no excretion of accumulated acetone bodies. Here at least it is difficult to believe that the direct causation of coma could be attributed to them.—(*Lancet*, April 10, 1926).

Acute Lymphatic Leukemia

John J. Tobinski, of Los Angeles, gives a report of this case:

History—Male, aged 35 years. Family history negative. Usual diseases of childhood. No other serious illness except a duodenal ulcer, for which gastro-enterostomy was performed in 1914 with uneventful recovery.

Present Complaint—Onset January 14, with chills, fever, and general aching sensation all over body, accompanied by some localized pain under the left rib margin in the hypochondriac region. Temperature, 102; pulse, 100. Examination revealed tenderness of entire left rib margin from the xyphoid cartilage to the lumbar spine. Pain was increased by respiration. A slight friction rub was noticed from the seventh to the ninth rib along the left sternal margin. Further examination was negative except for a slight glandular enlargement throughout, and slight abdominal distention. The skin was sallow.

From January 14 to January 21 there was no change in the patient's condition, except an increased restlessness. Diagnosis on this date was "diaphragmatic pleurisy."

January 21—Patient admitted to hospital; temperature, 99; p. m. temperature, 100; pulse, 112.

A slight swelling was noticed in the left hypochondriac region; radiologic report negative.

January 22—A definite tumor-like mass about 5 cm. in diameter was palpated in the left hypochondriac region; Widal and examination for malarial parasites were both negative.

January 23—Red blood cells, 3,500,000; leukocystes, 364,000; myeloblasts, 72 per cent; small lymphocytes, 15 per cent; polymorphonuclears, 12 per cent; easinophiles, 3 per cent. No basophiles or nucleated red cells.

January 24—The abdomen more distended. The splenic enlargement had increased, and the axillary glands a little more swollen. The patient complained of difficulty in breathing and some headache, with increased restlessness. He refused nourishment. Red blood calls, 3,200,000; leukocytes, 320,000; hemoglobin, 45 per cent (Dare); myeloblasts, 78 per cent; polymorphonuclears, 12 per cent; small lymphocytes, 8 per cent; and eosinophiles, 2 per cent.

January 25—Patient had a fairly comfortable day. Slept at intervals. The pain in the left side octninued. X-ray treatment over spleen and long bones commenced.

January 26—Patient was somewhat irrational, slightly cyanosed, and complained of severe pain in the left side. Red cells, 3,000,000; leukocytes, 297,000; myeloblasts, 70 per cent; polymorphonuclears, 16 per cent; small lymphocytes, 7 per cent; eosinophiles, 5 per cent; basophiles, 2 per cent; hemoglobin, 35 per cent. A few microblasts were found.

January 27—Condition more impossible; extensive cyanosis; pulse rapid and thready; extreme restlessness, with profuse diaphoresis. Red blood cells, 2,900,000; leukocytes, 308,000; myeloblasts, 62 per cent; polymorphonuclears, 14 per cent; small lymphocytes, 20 per cent; eosinophiles, 4 per cent., and a few normoblasts; hemoglobin, 25 per cent.

January 29—Patient markedly delirious. At times unconscious. The cell count showed 293,000 white; 2,200,000 red; myeloblasts, 73 per cent; polymorphonuclears, 32 per cent; small lymphocytes, 5 per cent; no eosinophiles. Normoblasts increased with a few basophiles. Hemoglobin, 25 per cent.

January 30—Patient expired at 2:25 a. m.

Necropsy Notes—No adenitis. Muscle tissue red in color. Liver extends 8.5 cm. below tip of ensiform cartilage and to 10 cm. below costal margin right nipple line, to cartilaginous attachments of sixth rib on the left side; shows fatty degeneration; measures 25 x 21 x 12 cm.; weight, 2,500 to 3,000 gms.

Spleen, adherent to adnexa, measures 20 x 12 x 11 cm.; weight, 4½ pounds. Capsule adherent; substance cuts without resistance; outer portion hemorrhagic to a depth of 5 cm.; remainder of substance grayish-white, with prominent Malphighian bodies. Pericardial sac contains about 90 c.c. of clean straw-colored fluid; left aurice and ventricle contracted; right auricle and ventricle relaxed. Muscular wall of left ventricle, 1.8 cm., and right 0.6 cm. in thickness. Weight about 300 gms. No sclerosis of coronary arteries. Post-mortem clot in right auricle and ventricle. Peribronchial glands enlarged; anthracosis marked; hypostatic congestion of left lower lobe. Thymus persistent. Right suprarenal of normal size; left, twice the size of right, with considerable congestion and petechial hemorrhages into medullary portion and cortex.

Kidneys—Cortices thickened; pyramids enlarged; multiple punctate hemorrhages into surface areas. No apparent structural change in the pancreas.

Anatomic Diagnosis—Acute splenic leukemia.

Summary—This case presents interesting phases, evidenced in: 1. Sudden onset, the patient having been previously well. 2. Symptoms were referable to the spleen; diagnosis was made by blood count. 3. Duration of illness very short; only two weeks from onset to death. 4. Daily intensification of the disease, as evidenced by the changing blood picture. 5. X-ray therapy of no avail, because the disease was progressing too rapidly. 6. Necropsy picture much like that of an acute infectious disease.—(*Cal. & West. Med.*)

Vincent's Angina

In 1894 Plunt, and in 1896 Vincent, conclusively showed that Vincent's angina was caused by two micro-organisms, which were always found together, namely, the B. fusiformis and a spirillum, says Miller and Epstein of San Francisco. These organisms are present in great numbers in every case of Vincent's angina, but are never found in pure culture. There are always present various pyogenic cocci, diphtheroids, occasionally a leptothrix, and at times other organisms. It is believed by some observers that the fusiform bacillus and the spirillum are different stages in the life cycle of the same organism. Pure cultures of B. fusiformis have a very low grade of pathogencity. Large doses injected into the pleural cavity of the rabbit causes little reaction. Pilot et al. showed that, in order to produce a putrid lesion, one of the pyogenic cocci had to be added to the injection. When death occurs in experimental animals that have been due to a streptococcal septicemia. The spirillum and fusiform bacillus are found only in a small localized area at the site of injection.

Smears from typical Vincent's angina vary according to the age of the lesions and the place from which they are taken. In general, older lesions show a preponderance of spirilla, while early lesions show a preponderance of bacilli. Campbell and Dyas, and Gifford showed that smears from the surface of the lesions contained many more bacilli than spirilla, while smears from the deeper parts of the lesions showed the reverse. The typical picture of Vincent's angina, as seen by gentian violet stain, shows that the fusiform bacillus and the spirilla greatly predominate. The spirilla may form interlacing masses with the fusiform bacilli entangled in their meshes. The spirilla are approximately uniform in size and curvature, but varying forms may be encountered. The fusiform bacilli vary somewhat in length, and may have blunt ends without the typical fusiform structure. Some of the bacilli may be curved. In addition to these organisms, but always in the minority, are staphylococcus, streptococcus, diphtheroids, leptothrix, and occassionally other organisms. The decision as to whether or not a smear represents true Vincent's angina depends on the actual number and uniformity of the B. fusiforms and spirilla present and their relationship to the number of other organisms seen. In Vincent's angina the fusiform bacilli and spirilla predominate.

Vincent's angina is essentially an acute and local disease. It usually begins as a stomatitis, pharyngitis or tonsillitis, in which there is a formation of a pseudo-membrane similar to that seen in diphtheria. This loosely adherent grayish film may remain for some time or quickly separate, leaving a well-defined, somewhat punched-out ulceration similar to that seen in late syphilis. A very common place for the infection to begin is just behind the last molar. The disease does not remain localized in one or two areas for any period of time. Close examination will reveal superficial ulceration around many of the teeth margins, in which masses of spirilla and fusiform bacilli can be demonstrated. There are never any bullous lesions in true Vincent's angina. The disease does not cause much systemic disturbance except for an occasional fever of around 100 degrees. There is some local pain, but not as much as the amount of tissue destruction would indicate. There is very little regional adenopathy in an uncomplicated case. The Wassermann reaction is always negative.

Inasmuch as the B. fusiformis and spirillum can be demonstrated in practically every ulceration of the buccal mucous membrane, their mere presence or absence in a lesion cannot be taken as the basis for a differential diagnosis. The clinical differentiation of the following conditions from Vincent's angina is of the utmost importance:

1. *Syphilis*—A primary lesion is generally a solitary one and is accompanied by a rather marked regional adenopathy. If material for a dark field examination is taken from the depths of the lesion it is generally diagnostic. The mouth lesions of secondary syphilis are accompanied by other evidences of the disease. Tertiary lesions are essentially chronic and localized. A therapeutic test with mercury or iodide will make the diagnosis.

2. *Diphtheria*—The patient is generally quite sick. A culture will reveal the causative agent. It is often clinically difficult to differentiate atypical cases.

3. *Tonsillitis*—The condition is limited to the tonsils. Patient feels quite sick and has a relatively high fever.

4. *Mercury and Bismuth Stomatitis*—A history of medication, with one or the other of these drugs, will substantiate the diagnosis.

5. *Pyorrhea Alveolaris*—This is essentially a chronic disease. It is always limited to the margins of the teeth, and is accompanied by little or no ulceration.

6. *Erythema Multiforme*—The lesions are bullae or ruptured bullae. They may be limited to the mouth. Vesicles or bullae never occur in Vincent's angina.

7. *Pellagra*—A stomatitis and gingivitis frequently occurs in this condition. Some other manifestation of the disease will suggest the diagnosis.

8. *Acute Leukemia*—The authors have recently seen three cases of acute leukemia that had been diagnosed as Vincent's angina. In this condition the hypertrophy of the gums may be so great that they overlap and almost completely cover the teeth. This hypertrophy is due to a leukemia infiltration and may be ulcerative. A differential blood count will make the diagnosis of leukemia.

The literature contains a few brief reports of skin eruptions, supposedly due to Vincent's angina. They have seen many patients with skin eruptions and associated mouth lesions that contained fusiform bacilli and spirilla. None of them, however, was Vincent's angina. Some were streptococcal sore throats, others were measles, pellagra, erythema multiforme, and syphilis.

Stern recently reported the existence of genital or mucous membrane lesions with regional adenopathy, with macular skin rashes and positive Wassermann reactions in which a fusiform bacillus and spirilla were found. The disease was not readily transferred from one individual to another; it cleared up under one arsphenamine injection and, in fact, in some cases without any treatment at all. Stern believes that the spirilla which he found were different from those found in Vincent's angina. In other words, the condition with which he was dealing was not Vincent's angina, but a spirillosis that he termed "parasyphilis," and was due to some unclassified organism. The term parasyphilis is ill-advised, as it is already in the literature as applying to tabes dorsalis and general paresis.

Textbooks contain a list of many drugs that are said to be of value in the treatment of this disease. The authors have used many of the dyes, silver nitrate, Fowler's solution, mercurochrome, and the arsphenamines.

At present they use only neoarsphenamine because they have found that it is of more value than any of the other drugs. They apply it locally at 24-hour intervals. After opening an ampule of neoarsphenamine, they dip a swab into the powder and apply it to the involved areas. The moisture about the individual lesion causes the powder to go into solution. They always apply it to both tonsillar areas and around all teeth, whether there is any apparent involvement or not, but do not give it intravenously, because they have found that improvement is just as rapid by the local method. Furthermore, by this method they avoid the danger of clearing up an undiagnosed syphilitic lesion or of giving the patients an arsphenamine dermatitis.—(*Cal. and West. Med.*, Vol. XXIV, No. 5.)

"Sabbiatura"

Of quite recent years the public have discovered for themselves the sensations of well-being which are to be derived from the warm sand-bath, and at some continental seaside resorts part of the day's sanitary régime consists of being buried and burying others in the hot expanse of the shores. Apart from physical enjoyment the hot sand-bath has properties which have been found useful in the treatment of such conditions as rheumatism, rheumatoid arthritis, neuritis, lumbago, sciatica, and forms of chronic synovitis, the treatment in these directions being specially studied and applied at the little old town of Alassio which is situated on the Italian Riviera, between Porto Mauritzio and Albenga, 23 miles from San Remo, where there is a fine strip of pure silica sands some three miles long. Unlike most places on the Italian Riviera, Alassio has both a winter and summer season, and during the latter period the dress of both sexes mainly consists of bright-colored towelling with a shady head covering. There is practically no tide, and bathing in the warm water is safe even for children.

The sabbiatura, as the hot sand-bath treatment is called, is carried out from the middle of May to the middle of September. A trench is prepared in the early morning and allowed to absorb the full heat of the sun till half an hour before noon when the patient is put into it and covered with the hot, dry sand. Here he remains for half an hour, during which time profuse perspiration takes place; he emerges coated thickly with wet sand. A plunge in the sea closes the sand-bath and washes the skin, and the patient emerges from the water invigorated and with a hearty appetite. A course of baths usually lasts from four to five weeks, but in transient cases of trouble may be shorter, and longer in more obstinate maladies. Medical supervision of these baths is offered at the Villa Iris, beautifully surrounded by a garden of palms and fruit and flowering trees under the shelter of Cape San Croce. Here heliotherapy and physical exercises are carried out all the year.—(*Lancet*, Feb. 27, 1926.)

The Effect of Early Treatment of Congenital Syphilis in Children

Of 80 children with more or less definite signs of congenital syphilis who had received early treatment and been kept under observation by G. Gardel for several years 72, or 90 per cent, survived. Death in 5 of the 8 fatal cases was due to an intercurrent infection. Syphilis by itself was rarely the cause of death, which is not surprising in view of the fact that there were few severe cases with grave visceral lesions. Among all the manifestations of congenital syphilis eruptions entailed the gravest prognosis (6 out of 20 cases were fatal). The earlier they appeared after birth the more serious they were likely to be. Eruptive cases constituted 80 per cent of the deaths.

In fatal cases death almost always occurred in the first year, especially in the first six months (7 out of 8 cases.) The child's future depends mainly on the conditions of hygiene and the environment in which it is brought up. None of the cases observed by Gardel was admitted to hospital and almost all (70 per cent) had been fed at the mother's breast, or at least had a mixed diet (13 per cent). Of the 72 survivors who had undergone more or less regular mercurial treatment 48, or 66.6 per cent, were absolutely normal at the time of the last examination, and 24, or 33.3 per cent, showed stigmata of congenital syphilis. Sequelae were relatively rare and generally mild.—(*These de Paris*, 1925, No. 520.)

Tryparsamide Therapy in Neurosyphilis

Skoog states that tryparsamide is a valuable addition to our therapeutic armamentarium for the treatment of all forms of late neurosyphilis, but of the greatest value in our battle against paresis; although we should not rely upon this preparation alone, for there are many things to be considered in the handling and treatment of the various types of syphilis of the central nervous system. An arrested case of paresis may be considered as a restoration from a practical point of view. The stability of tryparsamide and the simplicity of its preparation for administration should appeal to the average physician. Untoward effects which might be attributed directly to this chemical occur less frequently compared with most other arsenical preparations. The optic nerve and retina should be examined or observed by a competent examiner or ophthalmologist before starting the treatment and during the course. Further time, possibly five or ten years, will be required before tryparsamide can be valued properly, and it will be interesting to follow up the chronological sequences of these patients for many years following their treatment. Skoog believes that tryparsamide, having gone through a successful clinical experience of more than three years, certainly is worthy of an extended and more intensive trial.—(*Jour. Miss. State Med. Assoc.*, October, 1925.)

Pneumonia

Mr. L., age 65, hotel manager. Injured his left leg in a fall on May 25. June 9 I was summoned and found a severe case of septicemia, and promptly opened wound in front of tibia applying moist antiseptic dressing. The left inguinal glands were enlarged. On the morning of the 12th of June he suffered a chill and developed a cough with pneumonia in the right lobe, passing two restless nights with coughing and pain in right side. He was removed to Morton Hospital on the morning of the 16th suffering with consolidation of the middle and lower lobe on right side, pleuritic effusions. Some of the effusion was drawn off and he was immediately placed on Mulfords pneumococcus antibody solution for the pneumonia while given a hundredth of digitalin every four hours hypodermically, together with drinks of coffee and whiskey, the leg being treated as before. In the first 24 hours we gave him 220 ccs. of the pneumococcus antibody solution intravenously.

The laboratory reported that his pneumococcus was type two. Antibody solution has the same action in type one, two and three, but has little or less action on type number four. This man's temperature receded at the end of twelve hours and he made an uninterrupted recovery as far as the pneumonia was concerned.—(*Morton Hosp. Bull.*)

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In Memoriam
William Francis Campbell

The loss of Doctor Campbell will be hard to bear, since he bore such vital relationships to so many departments of medicine and to so many human beings who loved him. To medical journalism (as exemplified in his long sustained and thorough work on the MEDICAL TIMES), medical education, military medicine in war and in peace, research work in cancer, hospital service, authorship, and administrative work in National and State societies, he gave unwearying devotion. His genius for friendship, his exceptional powers as a speaker, his scholarship and cultural background, and his dynamic personality gave him a distinctive orientation among us.

What a full life! What a man! What a memory!

Changes in Practice

Dr. William Browning, of Brooklyn, points out the greatly lessened incidence of malaria, lead poisoning, diphtheritic paralyses, scrivener's palsy, etc., and the increasing prevalence of encephalitis, polio, accidents, neuro-syphilis, apoplexies, depressive states, insanity and cancer. In part the latter group come from longevity, and in large part affect the nervous system.

There has been a notable gain in the average length of human life. Consequently there has been, necessarily, a greater amount of late-life illness. This calls for a more intensive development of geriatrics.

As people live longer and the infections are suppressed, Browning predicts a greater incidence of nervous diseases. He finds that the total number of nervous cases in a really general hospital, like the Kings County in Brooklyn, far outnumber those of any other department, even that of general medicine or surgery. The total number of discharges at Kings County Hospital for the years 1923, 1924 and 1925 sum up for the Medical Division 12,221, for the Surgical 10,470, and for the Neurological 18,204.

Browning thinks that the full effect of longevity on the occurrence of neuroses may not come for some time yet. Obviously, there is going to be an increased call for sound neurologic training. Browning pleads for development of our facilities for instruction in neurology and for an extension of hospital opportunities in this field.

An economic factor that is going to intensify nervous wear and tear in the aged is the lessening ability under our social system to lay by a competence.

A Problem for Chemistry

Dr. H. Gideon Wells, Professor of Pathology in the University of Chicago, in his recent address at Columbia University, pointed out that immunology is primarily a branch of biological chemistry, and that problems of great interest and of the highest importance await solution by the chemist working in co-operation with the immunologist. We have made a beginning in applied immunity by learning how to prevent typhoid, smallpox and cholera, and how to cure diphtheria and scarlet fever. But we have made little or no progress with the rest of the great category of infectious diseases. Such infections as pneumonia, peritonitis and influenza still baffle us.

"Our prospects of any great advance by means of improvement of the methods we now know and use seem but slight. We must have a new method and that is to be furnished by the joint action of the chemist and the immunologist.

"When we learn just what these mysterious protective agents are, how they act and how to produce them artificially at will, we shall not have to depend upon the dilute solutions of these agents that we can extract from a horse or can cause to develop in a man's own blood, but we can give him as much as he needs of the active agent that has been prepared by synthetic chemistry."

Mussolini's Ailments

A curious revelation of human nature is the gloating of certain writers over Mussolini's supposed peptic ulcer. Perhaps he has no ulcer at all, really; his critics may only assume that he has, so ardent is their wish that the hated one be afflicted by some disabling lesion. But whether he has or not, the desire of his enemies is that something—anything—will smash his dream of personal power, of empire, and of the re-creation of the Italy of the Cæsars. With what glee do they dilate upon the alleged miseries of the great dictator, infected and prostrate at last, living always upon the verge of the hoped-for perforation.

More than ever, democracy delights to see the strong man reveal his actual identity with the mob, in terms of disease or anything else; an ulcer makes kin of the god. The great leader, missing his step, is at once torn to pieces by millions of jackals, who, but a moment before, fawned upon him and licked his claws.

Perhaps it is not necessary for Mussolini to fall through a perforated peptic ulcer; his fall may be consummated just as well by a sincere conviction that he has what he has not. An illusion will serve just as well as reality. What modern ruler could resist his peoples' and the world's conviction that he was slowly and miser-

ably perishing, a conviction born of the bitterest fear and hatred?

The defenses of the tyrant, always a naïve personality at bottom, are to-day flimsier than ever. He can be dethroned by simple psychologic factors. The sword of the assassin is much too crude for those who slay the great of to-day. To-day they are sentenced to peptic ulcer.

Character Outweighs Scholarship

Yale University will hereafter attempt to estimate the character of incoming students in addition to the usual investigation of scholastic records. We dare say that if a boy shows up well under the character tests there will not be so much insistence upon scholarship. Why should there be?

This is exactly what is needed in the medical schools. Why should boys of sterling character and potentialities, bound to succeed or to shine in the profession, be turned down in large numbers because of scholarship deficiencies, while objectionable types of applicants, able to satisfy the educational criteria, are accepted?

There is something essentially rotten about a rigid system that would to-day be impenetrable to some of the greatest figures in the whole history of medicine.

Unless good character is taken more into account it will cease to be developed in our youth. God knows there are already signs enough of its depletion.

Tobacco and Ulcer

Smithies and others are emphasizing the fact that peptic ulcers are especially prone to appear in certain ulcer-bearing sites that are distinguished particularly by poor circulatory equipment. Spasm or any type of blockage in the vessels of these areas becomes an additional factor in the etiology.

Now it is a physiological fact that nicotine poisoning causes a lessening of the calibre of the arterioles, and it is a clinical fact that males predominate as subjects of peptic ulcer of all types.

Have we any special observation that would tend to substantiate the idea that associates nicotine poisoning with ulcer?

We have, since Sir Berkeley Moynihan, in his *Abdominal Operations*, insists upon the disastrous results of allowing patients who have been operated upon for peptic ulcer to smoke. He has found that this is the most dangerous thing that a post-operative patient can do, since it directly interferes with healing and convalescence and invites a catastrophe, perhaps in the form of further ulceration.

There would appear to be something in the idea suggested, and our vast ignorance of the effects of tobacco, despite its common use and its toxicity, does not permit us to scoff at such reasoning.

Protein Therapy for Gastric and Duodenal Ulcers

On the basis of his experience in 100 cases Von Friedrich has come to the conclusion that duodenal ulcers are more amenable to protein therapy than gastric ulcers. In callous penetrating ulcers and bleeding ulcers the treatment proved unsuitable as the bleeding now and then recurred.

Protein therapy is indicated when all other methods fail, but by this he does not mean that it should be tried before every operation.

The course of treatment consists of from ten to twelve injections. The best results were obtained by giving small doses at first and gradually increasing them. The results as regards the permanency of the cure cannot be designated as favorable. The chief advantage of the treatment is its economic aspect as it can be given to ambulatory patients.— (*Muench. med. Wch.*, 1925, lxxii, 428.)

Miscellany

CONDUCTED BY ARTHUR C. JACOBSON, M. D.

The Suicide of the Superior

"In every society some qualities are valued and supposed to be admirable and good, and are selected and rewarded accordingly. Hence the lucky possessors of these qualities are highly remunerated and enabled to rise in the social scale.

"Social promotion is thus the reward of whatever merits a society chooses to recognize.

"But this reward of ability is also its capital punishment.

"For as it rises it passes from a social region in which the birth rate is relatively high and the prospects of parentage are comparatively good to others where the birth rate gets lower and lower.

"The higher it gets, therefore, the more it tends to be sterilized.

"Thus the particular kind of ability a society recognizes, the cream the society wants, is always rising to the top; but when it gets there, it is always being skimmed off and cast away.

"The civilized state is continually pumping up from the lower strata the particular sorts of ability that are valued, concentrating them in the upper strata, and there destroying 50 per cent. of them in every generation."

—*F. C. S. Schiller.*

The Physician's Library

Opium: The Demon Flower. By Sara Graham-Mulhall. New York. Harold Vinal. 1926.

This book discusses the opium problem from many interesting angles. The author displays the crusader's zeal rather luridly but is obviously sincere in her determination to transmit to the reader such information as she has acquired in her special field of experience and to arouse in him a hatred of the drug equal in intensity to her own. Apart from its somewhat emotional tone the book is a useful résumé of the world situation as regards opium.

Now that the ratification of the Opium Convention signed in Geneva last year is doomed to failure the way is open to the United States to call a conference, and then the author's hopes that America will lead a successful fight against the menace of opium should be realized.

Yet the author confides to us that, after all, world safety lies only in elimination of the poppy; useful plants must be cultivated in place of it. But she concedes the necessity for "synthetic opium" (and synthetic cocain), and would naïvely have us believe that such a synthetic drug might possess all the virtues and none of the evil potentialities of opium. That seems like a dream almost as illusory and evasive as any ever inspired by the "drowsy syrup" itself.

We recommend a reading of this book.

Incipient General Paralysis

Henry A. Bunker studied 74 cases. If certain nervous or mental symptoms are consistent with incipient general paralysis, as certain ambiguous physical symptoms may be consistent with early tabes, then the presence of such symptoms in a patient, if they are not otherwise clearly to be accounted for, calls at least for examination of the pupils and of the knee and ankle jerks and for a Wassermann test, and raises the question, even when the evidence from these two sources is negative, of the necessity for lumbar puncture.

The most common early symptoms in this series were found to be: Irritability, 42 cases or 57 per cent; quietness, 28 cases or 38 per cent; loss of weight, 22 cases or 30 per cent; sleepiness, 15 cases or 20 per cent; speech, memory, and judgment defects, 11, 15, and 7 cases, respectively.

Visual impairment, digestive disturbance, insomnia, fatigability, headaches, tremor, and rheumatoid pains were present as the earliest manifestations in a very few cases.—(*Am. J. Med. Sci., p.* 386, 1926.)

Obstetrics & Gynecology

Insulin in Vomiting and Eclampsia

A comment on the treatment of excessive vomiting and eclampsia by means of insulin lately appeared in the *Jour. A. M. A.* of Feb. 20th. After a brief review of the statistics of vomiting in pregnancy, the articles refers to the work of Thalhimer who, it may be remembered, recommended the use of insulin and glucose in all conditions inducing acidosis, whether associated with diabetes mellitus or not. He has reported very good results by the application of this method of treatment to the toxaemia of pregnancy. The summary of his method is as follows: 1,000 c.cm. of warm 10 per cent glucose solution are injected intravenously at the rate of 200-300 per hour. A quarter of an hour after the injection has been commenced 10 units of insulin are given hypodermically. Similar doses of insulin are given throughout the injection until 30 units in all have been administered. Thalhimer has also used this method in eclampsia, and he states that it is particularly successful if there is ketosis. He does not recommend that this form of treatment should be used alone in cases of eclampsia, but suggests that some form of anti-eclamptic measures such as a Stroganoff treatment should be adopted as well.

In a later issue (March 27th) of the same journal Paul Titus, of Pittsburgh, strongly criticises this kind of treatment. He says that insulin should *not* be added to the glucose injections given for the vomiting of pregnancy and that "it seems positively dangerous in eclampsia," and quotes the opinion of the Toronto group as contained in the following statement from *Medicine* (August, 1924), by W. R. Campbell and J. J. R. Macleod:—

"The use of insulin in pernicious vomiting in pregnancy is, in our opinion, unnecessary. No case of post-operative acidosis has required it, and it is difficult to see what purpose it could serve. Its use in non-ketonic acidoses is even more questionable, and, indeed, one may be permitted to doubt its value in conditions other than those in which there is a distinct deficiency of endogenous insulin production. Those who insist on regarding all the ills the flesh is heir to as due to an indefinite endocrine unbalance will do well to pause before applying insulin recklessly. Insulin is a powerful drug. . . . Thalhimer suggested the use of insulin in addition to glucose to control the condition [vomiting of pregnancy] in severe cases. It is difficult to appreciate the use of the drug in this type of case. In Toronto no case of uncomplicated pernicious vomiting sufficiently severe to warrant the trial of insulin in addition to fluids and glucose has been encountered in the last two years."

From this it is evident that the use of insulin in toxemia of pregnancy or eclampsia should certainly not be regarded as of proved value, and the same is true of its use in the malnutrition of infants in spite of satisfactory results summarized in the *Boston Medical and Surgical Journal* of April 8.—(*Lancet*, May 22, 1926.)

Obstetrical Heresies at the Brooklyn Hospital

Discussing the above, William S. Smith found that out of two thousand consecutive cases of labor there were 134 babies stillborn or who died in the hospital before the mother was discharged. Fifty-eight of these babies were premature, weighing between one pound and five pounds.

There remains a group of 76 fetal deaths in babies weighing over five pounds or a chargeable fetal mortality of 3.8 per cent. In this group there were 42 stillbirths and 34 babies who died before the mother left the hospital.

In these two thousand cases the maneuver of manually rotating the child through an arc of 180 degrees has been executed 82 times. Ten babies died from labors in which this procedure was practiced. Fetal death was not due in any one of these cases to prolapsed cord or to interference with the placenta. Death was due, in five cases to intracranial hemorrhage, as proved by autopsy; in four cases death was probably due to the long, hard labor, and very probably to brain trauma, and the tenth baby died because the cord was tight around the neck at delivery. It is fair to say that the procedure of 180 degree manual rotation, per se, has not been responsible for the death of any baby in this group. They would have undoubtedly saved many of these eighteen babies who died from long, hard labors, if they had done more cesarean operations, but there was no serious bony dystocia in any of these young primiparous patients, and the probability is that their second labor will go fairly smoothly while, if they had been sectioned with the first labor, this major operation would be in order for the second.

In these 2,000 consecutive cases of labor, 82 had manual 180 degree rotations. Fifteen of these had morbidity. In these 15 cases a possible cause of morbidity was as follows: phlebitis of the femoral vein, 2; low grade perineal infection, 3; metritis, 2; incisions of the cervix, 1; fibroids, 1; manual extraction of the placenta, 1, and long hard labors, 5. He cannot say that the intrauterine manipulations had nothing to do with causing the above 15 cases of morbidity, but he says that he has records of 67 other cases of manual rotation in which there was no fever or other untoward reaction.

Smith's observations on morbidity after incisions of the perineum are that out of 672 median and mediolateral perineotomies and 171 lateral episiotomies in this series of cases, only 75 median and 37 lateral incisions had morbidity. Furthermore, this morbidity is by no means entirely chargeable to the perineal incisions. As far as figures are concerned, he has records of 597 median perineotomies, and of 134 lateral episiotomies in which there was no fever.

1. Manual intrauterine rotation of the fetus in selected cases, whereby the position is changed from an occipitoposterior to an occipitoanterior through an arc of 180 degrees, does no harm to the mother and but rarely jeopardizes the child. It is of great benefit to mother and child because of the shortening of labor and because of the diminution of trauma when the labor is terminated.

2. Conservative vaginal delivery, rather than a too frequent resort to cesarean section, justifies the occasional loss of a baby in a young primiparae.

3. If a patient is delivered under deep anesthesia, the principle of expressing the placenta at the first uterine contraction and keeping the uterus empty thereafter is essential in the prevention of postpartum hemorrhage.

4. It is not in evidence that incisions of the perineum or manual rotations of the fetus in utero are a major causative factor in producing puerperal morbidity.—(*Am. Jour. Obst. and Gynec.*, March, 1926.)

Fibroids of the Uterus

A comparative study of two five-year periods in the treatment of fibroids by Weiss of Pittsburgh, shows that: (1) His attitude is decidedly conservative in the uncomplicated cases. (2) When any complication exists, he heartily favors operation. (3) When the preservation of the maternal and sex function is desirable, operation by myomectomy or resection is preferable. (4) The most favorable cases for irradiation are the bleeding variety. (5) The handicapped patients with diabetes, tuberculosis, cardio-renal disease, etc., are best treated with radium, at least as a trial. (6) Curettement should be performed as a diagnostic measure in every instance before radium is introduced. (7) In patients younger than forty, radium should be used only with extreme caution in order to avoid causing a premature menopause. (8) Many fibroids may safely be kept under observation and operated only if definite indications arise.

Since using radium and very carefully observing all the contraindications to its use, his records show that during the past five years a fair percentage has been so treated with very satisfactory results. However, he still adheres to the general principle that when in doubt, operation should be the procedure of choice. While no new line of thought has been presented by this study of more than 1,200 cases, he has endeavored to show that fibroid tumors of the uterus are not to be necessarily relegated to operation, especially the radical form of treatment. At the same time he has shown that operative mortality and morbidity can be very definitely reduced by the judicious employment of radium when used alone or as an adjunct to surgery.—(*Am. Jour. Obst. and Gyn.*, March, 1926.)

Hemorrhages from the Urinary Bladder Varix in Pregnancy

Midzutani reports a case, 35 year old woman, in whom hemorrhage from the urinary bladder occurred toward the last stage including the parturition period, but cured by itself as labor ended. She had Wassermann negative, and although her kidney had not been examined, cystoscopical examination made after the labor proved that there were foci of swelling and ulceration of the varix in the bladder. From these facts, it might be clear that, from some still unknown cause, there occurred such hemorrhages in consequence of pregnancy.—(*Tokio Iji-Shinshi*, March, 1925.)

Spinal Anesthesia in Obstetrics

Vandesial feels that there is little justification for obstetricians to continue in ignoring spinal anesthesia for certain cases, after the results obtained by Bundeau with this procedure.

Indications for its use may be classified as follows: (a) when in the course of a prolonged labor a period of one to two hours' rest is desired; (b) where it is necessary to obtain anesthesia of the genital regions, as with rigid perineums or when forceps or breech extractions are indicated; (c) in cases where digital dilatation of the cervix is to be carried out, and (d) where pubiotomy or cesarean section is indicated. In cesarean section this type of anesthesia is preferable to a general anesthetic because hemorrhage and shock are lessened.—(*Brux. Med.*, *xxv.*, 845, 1925.)

Public Health

Typhoid Carriers

The carrier problem is one of the most puzzling with which the health officer has to deal. Carriers are the only permanent source of new infections, as far as we know, yet their control has not been solved either scientifically or legally. We have learned a great deal about the carrier state and by the examination of food handlers have succeeded to a considerable extent in checking outbreaks of typhoid fever, but cases are constantly coming up which show that this does not solve the problem, even if it were effectively carried out.

A recent case is that of a fisherman who apparently infected 6 cases through association on board a fishing schooner, although he had nothing to do with the preparation or handling of food. The indications are that he had been a carrier since an attack of typhoid fever 13 years before. A similar case is that of Martin Olsen of the ship "Acme" sailing out of San Francisco. He was a winch-tender who, through using a water cask common to other sailors, was responsible for a number of cases of typhoid in several crews. The danger is, of course, tremendously aggravated when a carrier has anything to do with the preparation or handling of food. Beginning with "Typhoid Mary" a long list of such cases has been placed on record, and new ones are constantly cropping up. The work of Havens, already mentioned in these columns, indicates that the carrier problem is more serious than we have suspected in the past, at least in certain parts of the country.

A recent case in England is attracting the attention of health officers. Twenty-seven persons were infected by a woman milk-seller who was unconsciously a germ carrier, apparently in perfect health. In this instance all the health officer could do was to prevent her from selling milk or handling any kind of food for sale. The laws did not allow him to proceed further. While large powers are given to the Ministry of Health, and it would seem possible for it to promulgate orders for the confinement and treatment of healthy carriers, it is very doubtful if the courts would hold that the liberty of an outwardly healthy and morally blameless person could be taken away by departmental order. Parliament has the authority to pass such laws, but the best authorities in England do not know the extent of the carrier problem, nor do they know how to handle carriers when they are found, and while in many places provision is made for taking care of actually sick cases, there is practically no provision for those who are not outwardly sick.

The history of "Typhoid Mary" and the trouble she gave to health officers of New York is well known. In spite of the fact that the board of health had legal backing in this case, it eventually seemed necessary to release her, and she went back to her trade of cooking, spreading typhoid fever wherever she went.

Some carriers are apparently keenly alive to their condition and subject themselves willingly to every form of treatment without complaint. Martin Olsen submitted himself to treatment by vaccine and finally to extirpation of the gall-bladder, and a similar attitude may be expected of a number of these people, though it is more than doubtful if the law would sustain anyone in forcing such treatment in the present state of our knowledge. As far as the laws go, it seems that the suspected carrier has a perfect right to refuse to submit specimens for examination.

In a recent case, a man who was evidently directly responsible for one outbreak, and indirectly for a second, but who was not at this time engaged in the handling of milk, refused to allow a thorough examination to be made, and held himself to be aggrieved over the fact that he was suspected of being a carrier. The same thing seems to be true in England as well as in some other countries.

Some of our states have passed rather stringent laws such as compulsory examination, quarantine and treatment, with fine, imprisonment and liability for damages as penalties, but only in the case of venereal diseases as far as we are aware. The problem is beset with difficulties which await solution.

The detection of carriers is not a difficult thing provided proper specimens can be obtained. In the case of food handlers, the possible carrier is easily gotten hold of and is comparatively easily handled because of the financial interest of the subject in obtaining a position. Unfortunately, however, most of our carriers are detected only through the outbreak which they have occasioned and after the damage has been done.

While legal minds may wrestle with the problem of control, it behooves the bacteriologists and physicians to study the methods of prevention and cure. More of this has been done in England than in this country. Among the lower animals no decisive proof has been given that previous inoculation with typhoid vaccine materially reduces the proportion of animals which become carriers after appropriate inoculation. Chemotherapy has naturally been tried, with inconclusive results. There is reason to believe that early administration of certain chemicals after intravenous inoculation will prevent the formation of foci in the gall-bladder, but nothing has been found that will cure them with any degree of certainty after they have once been formed. It has been shown that these foci owe their origin to direct infection from the capillaries in the wall of the gall-bladder. Altogether the outlook does not appear to be bright for this method of treatment.

The results of surgical operation have been better. It can be positively stated that in a large majority of the cases in which excision of the gall-bladder has been done cessation of the carrier state has resulted, though it is admitted that the subsequent examinations have not always been carried out in the best possible manner. It appears that when cure results the Widal reaction becomes negative where it was formerly positive, and this may serve as a further indication of cure.

The use of antityphoid vaccine has not been uniformly successful. Martin Olsen was "cured" more than once, but relapsed. It appears that it cannot be depended upon any more than diphtheria antitoxin can be depended upon to cure the carrier state in diphtheria. In the latter disease removal of the tonsils gives the best guarantee of curing the carrier, but all surgical procedures have their limitations. In diphtheria the removal of the tonsils will not cure a case in which the germ is growing in the nasal fossae. In the case of typhoid fever, removal of the gall-bladder can never have any effect on the urinary bladder carrier.

We are impressed with the view that the carrier is rarely an entirely well person. He is not clinically sick, and may not be conscious of any inconvenience, but there is almost certainly a focus somewhere in which an abnormal or diseased condition exists.—(*Am. Jour. Pub. Health*, April, 1926.)

Does the Long School Day Menace Child Health?

F. H. Richardson looks for the cause of malnutrition so prevalent among the children of his practice. In its correction he points out as a necessity the removal of physical defects, and even more, the removal of causative faulty health habits—"The faultiest of all faulty habits indulged in by many children—is nothing more or less than undue indulgence in school attendance."

In his own practice, shortening the school hours in individual cases resulted in more than a gain in health. The children who previously had lacked interest in their studies, had been dropping behind in their grades or had been difficult from a disciplinary standpoint began to show new interest in their studies. Instead of dropping behind in their classes they did better work, educationally, as a result of the shorter hours.

Experience has proved that in the lower grades the child's capacity for learning is exhausted after 3 hours of work or less. Prolonged urging to imbibe at the fount of knowledge after this point is reached is no more effectual than attempts to persuade the horse at the watering trough to partake of the contents when he is not so minded.

"What is the reason for the retention of the long school day? Is it mere intellectual inertia, or is there some sound scholastic reason? . . . If it is doing harm, and if the short day will right that wrong and accomplish what we send our children to school for, let us have it, as we want every other good thing for that best of American institutions, the American free public school."—(*Kindergarten and First Grade Magazine*, Jan., 1926.)

Venereal Disease Manual

It was Osler, the great leader in modern medicine, who said—"Know syphilis in all its manifestations and relations and all other things clinical will be added unto you."

Many leaders in the social sciences are now saying in effect—know syphilis in all its manifestations and the cause of many social ills will be revealed.

Daily new developments emphasize the interrelationship between syphilis and gonorrhea and such social ills as feeble-mindedness and insanity, dependency and poverty, lubricity and delinquency.

Medical science has aided social science in the discovery of the cause. Social science in turn can aid medical science in removing the cause and tempering the effect.

The Division of Venereal Diseases of the U. S. Public Health Service is cooperating with the various State Boards of Health in a nationwide campaign for the control of venereal diseases. As a part of that program and also to fill an expressed need on the part of social agencies, the U. S. Public Health Service has prepared a Venereal Disease Manual for Social and Corrective Agencies. This handbook comprises 70 pages and is bound in buckram. This book may be purchased from the Superintendent of Documents, Washington, at the nominal price of 50 cents to cover the cost of printing only.